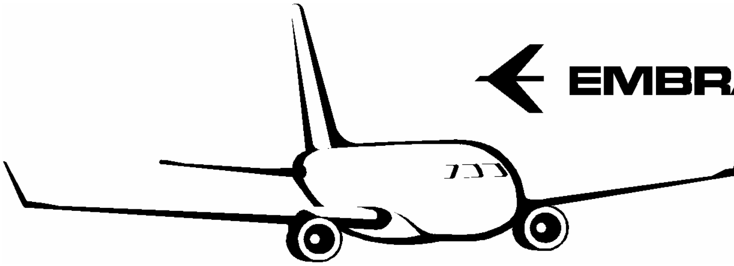


EMBRAER 170/175
FAA
AIRPLANE FLIGHT MANUAL

Embraer S.A.

THIS MANUAL IS APPROVED IN ACCORDANCE WITH FAR 21.29 FOR U.S. REGISTERED AIRCRAFT, AND IS APPROVED BY THE CTA ON BEHALF OF THE FEDERAL AVIATION ADMINISTRATION.
THIS DOCUMENT IS APPLICABLE TO THE FOLLOWING AIRPLANE MODELS: ERJ 170-100 STD, ERJ 170-100 LR, ERJ 170-100 SE, ERJ 170-100 SU, ERJ 170-200 STD, ERJ 170-200 LR AND ERJ 170-200 SU.

NOTE: - EMBRAER 170 AND EMBRAER 175 ARE COMMERCIAL DESIGNATIONS USED IN THIS MANUAL TO REFER TO THE ERJ 170-100 AND ERJ 170-200 MODELS, RESPECTIVELY.
- SOME MANUAL VERSIONS MAY NOT PRESENT ALL LISTED MODELS. FOR SPECIFIC CONFIGURATION, REFER TO LEP APPLICABILITY.

CTA APPROVAL: ______________________

CLAUDIO PASSOS SIMÃO – TEN.-CEL.-ENG.
CHEFE DA DIVISÃO DE HOMOLOGAÇÃO AERONÁUTICA

DATE: 20 FEBRUARY 2004

REGISTRATION NUMBER: ________________

SERIAL NUMBER: ________________

AFM–1385
CODE 003

FEBRUARY 20, 2004
REVISION 15 – OCTOBER 03, 2016

AFM Revision Approval

AFM-1385 – ERJ 170-100/ERJ 170-200 – FAA

REVISION 15

AFFECTED INFORMATION	DESCRIPTION OF REVISION
2-10 codes 03, 04	**OPERATIONAL LIMITATIONS** **KINDS OF OPERATION** Included Extended Overwater Operation for EMBRAER 175 airplanes Pre-Mod SB 170-57-0058.

TR 14.1 RP387V/NEA

AFFECTED INFORMATION	DESCRIPTION OF REVISION
4-01 code 01	**NON-ANNUNCIATED PROCEDURES** **ABNORMAL PROCEDURES** **GEAR LEVER CAN NOT BE MOVED UP** Updated abnormal procedure Gear Lever Can not be Moved Up due to PSEM-5 incorporation.

TR 14.2 RP390V/NEA

AFFECTED INFORMATION	DESCRIPTION OF REVISION
2-10 codes 03, 04	**OPERATIONAL LIMITATIONS** **KINDS OF OPERATION** Removed the prohibition for EMBRAER 175 airplanes Post-Mod. SB 170-57-0058 (Enhanced Wingtip) to perform Extended Overwater Operation.

TR 14.3 RP438V/NEC

AFFECTED INFORMATION	DESCRIPTION OF REVISION
S1-05 codes 06, 07	**LIMITATIONS** **CAFM-175-FAA-005 & CAFM-175-FAA-006** Added improved climb performance for EMBRAER 175 with Enhanced Wingtip.

TR 14.4 RP395V/NEC

AFFECTED INFORMATION	DESCRIPTION OF REVISION
1-20 code 01	**ABBREVIATIONS AND ACRONYMS USED** Included new terms in the abbreviations and acronyms list related to NG FMS (airplanes equipped with Load 27.1).
3-19 code 01	**DESCENT** Changed the identification of the MCDU Landing page to a generic name applicable to all load versions.
S-TOC code 01	**TABLE OF CONTENTS** Included new optional supplements related to RNP AR less than 0.3NM and LPV operations available to airplanes equipped with Load 27.1 and on.
S4-00 code 01 S4-05 code 01 S4-10 code 01	**PRIMUS EPIC - FLIGHT MANAGEMENT SYSTEM** Included note and updated all block titles (General, Limitations, Normal Procedures, Emergency and Abnormal Procedures, and Performance) to state the applicability of Supplement 04 code 01. Included note that correlates the used PBN nomenclature in the AFM with the recommended ICAO PBN specifications in the General and Limitations section. Updated the minimum configuration list for RNP AR operations in the Limitations section. Updated the approach limitation to allow the use of RNAV Visual and FMS Visual approaches using FMS as the navigation source for guidance. Removed the speed restriction limitation related to RNP AR operations with RF legs as it is an operational requirement. Updated the wording to verify the landing speeds on the approach phase of flight in the Normal Procedures section. Editorial Changes.
S4-00 code 02 S4-05 code 02 S4-10 code 02	**PRIMUS EPIC - FLIGHT MANAGEMENT SYSTEM** Included new code 02 of FMS supplement applicable to airplanes equipped with Load 27.1 and on (NG FMS).

TR 14.5 RP335VBNEC

S10-00 code 01 S10-05 code 01 S10-10 code 01	**CONTROLLER TO PILOT DATA LINK COMMUNICATIONS (CPDLC)** Revised current CPDLC supplement to include information related to FANS 2-CPDCL optional functionality available to airplanes equipped with Load 27.1 and on.
S12-00 code 01 S12-05 code 01 S12-10 code 01	**RNP AR OPERATIONS** Included new supplement related to optional equipment configuration for RNP AR less than 0.3 NM for approach and less than 1.0 for missed approach operations available to airplanes equipped with Load 27.1 and on.
S13-00 code 01 S13-05 code 01 S13-10 code 01	**LOCALIZER PERFORMANCE WITH VERTICAL GUIDANCE (LPV)** Included new supplement related to optional equipment configuration for LPV operations available to airplanes equipped with Load 27.1 and on.

TR 14.5

RP335VBNEC

AFFECTED INFORMATION	DESCRIPTION OF REVISION
4-01 code 01	**ABNORMAL PROCEDURES** **LOSS OF HYDRAULIC SYSTEM 1 AND 2** **LOSS OF HYDRAULIC SYSTEM 2 AND 3** Updated the Go-around Slat/Flap position from 5 to position 4.
4-16 code 01	**ABNORMAL PROCEDURES** **ELEVATOR LH (RH) FAILURE** **PITCH TRIM FAILURE** Updated the Go-around Slat/Flap position from 5 to position 4.

RP481V/NEA

AFFECTED INFORMATION	DESCRIPTION OF REVISION
2-10 codes 01, 02, 03, 04	**OPERATIONAL LIMITATIONS** **AIRSPEEDS** Added speed limitation to open the direct vision window. Changed unit for maximum tire ground speed from "mph" to "kt".
2-10 codes 01, 02, 03, 04	**OPERATIONAL LIMITATIONS** **TOWING** Improved the description of towing limitation in accordance with the AMM procedure.
2-36 codes 01, 02	**FUEL** **FUEL TANK TEMPERATURE** Updated minimum fuel tank temperature.
2-40 codes 01, 02, 03, 04	**POWER PLANT** **ENGINE THRUST** Added the power back limitation in the Engine Thrust procedure.
2-48 code 01	**PNEUMATIC, AIR CONDITIONING AND PRESSURIZATION** **PRESSURIZATION** Updates maximum differential pressure and maximum differential overpressure limitations.
2-50 code 01 3-41 code 01	**OPERATION IN ICING CONDITIONS** Added the height of 1700 ft AFE for which the TO DATASET MENU is effective. Replaced "between 5°C and 10°C" with " from 5-10°C". Changed ground temperature reference from SAT to OAT. Added new condition to set the TO DATASET MENU.
3-05 code 01	**POWER UP** Updated Power Up batteries voltage check. Removed the actions under each procedure step. Moved the step to test the emergency lighting system from Before Start procedure to Power Up procedure.
3-09 code 01	**BEFORE START** Removed the reference to verify the observer's masks. Added the action to select the Speed Selector Knob Manually. Removed the caution concerning the initial assigned altitude. Moved the turning ON of the Electric Hydraulic Pump Sys 3A from "After Start" checklist to "Shortly before startup".

RP56V3NEA

AFM-1385

AFFECTED INFORMATION	DESCRIPTION OF REVISION
3-13 code 01	**AFTER START** Removed the turning ON of the Electric Hydraulic Pump Sys 3A.
3-15 code 01	**BEFORE TAKEOFF** Added the phrase "if selected" after ATTCS indication. Moved the N1 check note to the takeoff procedure.
3-16 code 01	**TAKEOFF** Moved the N1 check note from before takeoff to the takeoff procedure. Improved the procedure description to specify the type of guidance provided by the flight director during takeoff roll.
S11-10 code 01	**NORMAL PROCEDURES** **TAKEOFF WITH TAILWIND ABOVE 10KT** Improved the procedure description to specify the type of guidance provided by the flight director during takeoff roll.
3-21 code 01	**APPROACH** Removed caution concerning the assigned altitude.
4-01 code 01 4-10 code 01 4-16 code 01 4-18 code 01	**EMERGENCY AND ABNORMAL PROCEDURES** Removed the list of relevant inoperative items from the AFM Emergency and Abnormal procedures. Changed wording of the abnormal procedures which specify the speed for landing configuration (new V_{REF}).
4-06 code 01 4-24 code 01 4-26 code 01 4-30 code 01	**EMERGENCY AND ABNORMAL PROCEDURES** Changed wording of the abnormal procedures which specify the speed for landing configuration (new V_{REF}).
4-01 code 01	**EMERGENCY PROCEDURES** **CARGO COMPARTMENT FIRE** Improved the description of Cargo Compartment Fire procedure.

RP56V3NEA

AFFECTED INFORMATION	DESCRIPTION OF REVISION
4-01 code 01	**EMERGENCY PROCEDURES** **DUAL ENGINE FAILURE** Updated the landing configuration specification in Dual Engine Failure procedure in case both engines are restarted via autorelight.
4-01 code 01	**EMERGENCY PROCEDURES** **ENGINE FIRE, SEVERE DAMAGE OR SEPARATION** Changed the maximum airspeed to V_A instead of 200 KIAS and rewritten the paragraph regarding the V_A airspeed to clarify its meaning.
4-01 code 01	**EMERGENCY PROCEDURES** **FUEL LEAK** Updated Fuel Leak procedure to remove the note related to leak detection and the consideration about severe fuel leakage.
4-01 code 01	**EMERGENCY PROCEDURES** **REJECTED TAKEOFF** Added Rejected Takeoff procedure.
4-01 code 01	**ABNORMAL PROCEDURES** **ENGINE ABNORMAL VIBRATION** Updated Engine Abnormal Vibration procedure to harmonize with GE SOI.
4-01 code 01	**ABNORMAL PROCEDURES** **ENGINE AIRSTART** Improved the Engine Airstart procedure by including a note related to ITT limit and an action to prevent fuel imbalance.
4-10 code 01	**ABNORMAL PROCEDURES** **ENGINE AIRSTART ENVELOPE** Increased left margin of Engine Airstart Envelope.
4-01 code 01	**ABNORMAL PROCEDURES** **LOSS OF HYDRAULIC SYSTEM 1** Added the action to disengage the autopilot after losing hydraulic system 1.

RP56V3NEA

AFM-1385

AFFECTED INFORMATION	DESCRIPTION OF REVISION
4-01 code 01	**ABNORMAL PROCEDURES** **LOSS OF HYDRAULIC SYSTEM 1** **LOSS OF HYDRAULIC SYSTEM 2** **LOSS OF HYDRAULIC SYSTEM 1 AND 3** **LOSS OF HYDRAULIC SYSTEM 2 AND 3** Included note regarding the use of thrust reverser in all procedures of Loss of Hydraulic System that results in loss of one reverser.
4-01 code 01	**ABNORMAL PROCEDURES** **LOSS OF HYDRAULIC SYSTEM 1 AND 2** Added crosswind recommendation and guidance for Emergency/Parking brake use during landing with Loss of Hydraulic System 1 and 2.
4-01 code 01	**ABNORMAL PROCEDURES** **LOSS OF PRESSURIZATION INDICATION** Updated Loss of Pressurization Indication table.
4-01 code 01	**ABNORMAL PROCEDURES** **STRUCTURAL DAMAGE** Changed the maximum airspeed to V_A instead of 200 KIAS in the Structural Damage procedure.
4-04 code 01	**WARNING** **CABIN ALTITUDE HIGH** Included action to pilots override the system in case of cabin altitude reaches 14500 ft and then press the dump button at 10000ft or MEA.
4-04 code 01	**CAUTION** **PRESSURIZATION AUTO FAILURE** Updated Pressurization Auto Failure procedure to avoid airplane depressurization at high altitude.
4-04 code 01	**CAUTION** **BLEED 1 (2) LEAKAGE** Updated Bleed Leakage procedure to remove information related to overpressure condition.
4-06 code 01	**CAUTION** **SHAKER ANTICIPATED** Modified the information regarding the flight above Mach 0.5 in the event of shaker anticipation. Harmonized the Shaker Anticipated procedure with the Flap (Slat) Failure procedure. Introduced the maximum bank angle on the final approach in the event of shaker anticipation.

RP56V3NEA

AFFECTED INFORMATION	DESCRIPTION OF REVISION
4-06 code 01	**CAUTION** **AUTO PILOT FAILURE / AUTOTHROTTLE FAILURE** Improved the description of Autopilot Failure and Autothrottle Failure procedures.
4-10 code 01	**WARNING** **ELECTRICAL EMERGENCY** Updated the landing configuration in case the EICAS message ELEC EMERGENCY extinguishes. Categorized the current note related to APU start in case of electrical emergency as a caution. Increased the airspeed limit to 150 KIAS minimum in case of electrical emergency. Removed the limitation of 130 KIAS in case the electrical emergency extinguishes.
4-10 code 01	**CAUTION** **DC ESSENTIAL BUS 1 OFF / DC ESSENTIAL BUS 2 OFF** Removed the instruction to use the Emergency/Parking Brake during landing in the DC Essential BUS 1 OFF and DC Essential BUS 2 OFF procedures.
4-10 code 01	**CAUTION** **DC ESSENTIAL BUS 3 OFF** Removed the step to turn off the APU in the DC Essential BUS 3 OFF procedure.
4-12 code 01	**CAUTION** **ENGINE REFERENCE ECS DISAGREE** Removed the note from the Engine Reference ECS Disagree procedure.
4-14 code 01	**CAUTION** **ENGINE 1 (2) FIRE** Included information about the use of fire-extinguishing handle in case the message ENG 1 (2) FIRE persists. Changed the maximum airspeed to V_A instead of 200 KIAS and rewritten the related paragraph to clarify its meaning.
4-16 code 01	**CAUTION** **FLAP (SLAT) FAILURE** Updated Flap/Slat Failure performance table. Updated information regarding the selection of the desired flap/slat position.

RP56V3NEA

AFM-1385

AFFECTED INFORMATION	DESCRIPTION OF REVISION
4-16 code 01	**CAUTION** **SPOILER FAULT** Updated Spoiler Fault procedure to add "for landing configuration" before reference to Slat/Flap position.
4-18 code 01	**CAUTION** **AVIONICS MAU 1A FAILURE** **AVIONICS MAU 2B FAILURE** Removed the instructions to use the Emergency/Parking Brake during landing. Included rudder as a mean to control the airplane in the Avionics MAU 1A Failure procedure.
4-18 code 01	**CAUTION** **AVIONICS MAU 1 (2) (3) A (B) OVERHEAT** Replaced the Avionics MAU 1A (1B) Overheat / Avionics MAU 2A (2B) Overheat / Avionics MAU 3A (3B) Overheat procedures with the Avionics MAU 1 (2) (3) A (B) Overheat procedure.
4-20 code 01	**CAUTION** **FUEL IMBALANCE** Added a note regarding verification of total fuel indication with one engine inoperative in the Fuel Imbalance procedure. Updated statement regarding altitude indicators mismatch in the Fuel Imbalance procedure. Updated text regarding crossfeed selector indicator from "low 1" and "low 2" to "LOW 1" and "LOW 2" in the Fuel Imbalance procedure.
4-24 code 01	**WARNING** **ANTI-ICE WING 1 (2) LEAKAGE** Improved Anti-Ice Wing 1 (2) Leakage procedure description and included information of required landing configuration.
4-24 code 01	**CAUTION** **ANTI-ICE WING FAILURE** Included banking angle limit in the Anti-Ice Wing Failure procedure.

RP56V3NEA

AFFECTED INFORMATION	DESCRIPTION OF REVISION
4-24 code 01	**CAUTION** **ANTI-ICE WING NO DISPATCH** Removed the procedure Anti-Ice Wing No Dispatch from the AFM.
4-26 code 01	**CAUTION** **BRAKE LH (RH) FAILURE** Removed the instruction to use the Emergency/Parking brake during landing. Added guidance to apply the normal brake gradually using rudder to steer the airplane in case of Brake LH (RH) Failure.
4-26 code 01	**ADVISORY** **BRAKE LH (RH) FAULT** Removed the instruction to use the Emergency/Parking brake during landing. Updated the landing distance multiplier in the Brake LH (RH) Fault.
4-30 code 01	**WARNING** **CARGO FORWARD (AFT) SMOKE** Improved the description of Cargo Forward (AFT) Smoke procedure.
S4-00 code 01	**GENERAL** **NAVIGATION OPERATIONAL APPROVALS** Removed the requirement for operators to use the Honeywell Sure Flight Off Line RAIM and FDE prediction program before the start of flight.
S5-10	**PERFORMANCE** Removed the note regarding approach climb speed.
S6-05	**LIMITATIONS** **MINIMUM EQUIPMENT REQUIRED** Updated note in the Minimum Equipment Required according to FAA AC 91-85.
S6-10	**NORMAL PROCEDURES** **CRUISE** Modified statement regarding altitude indicators mismatch.

RP56V3NEA

AFM-1385

AFFECTED INFORMATION	DESCRIPTION OF REVISION
1-00 code 01	**INTRODUCTION** Changed Embraer area name responsible for the content of AFM, the description of revision, temporary revision, and list of effective pages. Included change markings, configuration release, and AFM guidance information description.
1-00 code 01 1-10 code 01 1-20 code 01	**INTRODUCTION** **DEFINITION OF TERMS** **ABBREVIATIONS AND ACRONYMS USED** Deleted the wording "ANAC APPROVED" from General section page footers.

RP397VANEC

AFFECTED INFORMATION	DESCRIPTION OF REVISION
4-01 code 01	**ABNORMAL PROCEDURES** **ENGINE ABNORMAL VIBRATION** Updated Engine Abnormal Vibration procedure to keep it harmonized with the applicable GE SOI.

RP525V/NEC

ANAC – GGCP Approval
Date: Oct 03, 2016

Mario Igawa
General Manager
Aeronautical Product Certification Branch

INTENTIONALLY BLANK

RECORD OF TEMPORARY REVISIONS (AFM–1385)

TR N°	APPLICABILITY	DATE ISSUED	DATE REMOVED	INCORPORATED BY
2.1	Appendix 1	Aug 17/04	May 03/05	Revision 3
2.2	Section 2 and Supplements 1, 2 and 3	Sep 21/04	May 03/05	Revision 3
2.3	Sections 2, 3, 4 and Supplements 4 and 5	Dec 23/04	May 03/05	Revision 3
2.4	Section 2	Feb 21/05	May 03/05	Revision 3
3.1	Sections 2, 3, 4 and Supplements 1, 2, 3, 4 and 5	Sep 12/05	May 02/07	Revision 4
3.2	Supplement 6	Sep 16/05	May 02/07	Revision 4
3.3	Sections 2 and 4	Nov 30/05	May 02/07	Revision 4
3.4	Sections 3 and 4	Dec 02/05	May 02/07	Revision 4
3.5	Supplements 2 and 3	Dec 05/05	May 02/07	Revision 4
3.6	Sections 2, 4, 5 and Supplements 1 2, 3 and 5	Dec 07/05	May 02/07	Revision 4
3.7	Appendix 1	Dec 21/05	May 02/07	Revision 4
3.8	Section 2	Dec 23/05	May 02/07	Revision 4
3.9	Sections 1, 2, 4, 5 and Supplement 1	Oct 03/06	May 02/07	Revision 4

RECORD OF TEMPORARY REVISIONS (AFM–1385)

TR N°	APPLICABILITY	DATE ISSUED	DATE REMOVED	INCORPORATED BY
3.10	Sections 2, 3, 4 and Supplement 1	Dec 05/06	May 02/07	Revision 4
3.11	Supplement 1	Dec 19/06	May 02/07	Revision 4
3.12	Appendix 1	Jan 05/07	May 02/07	Revision 4
4.1	Section 4	May 30/07	Oct 10/07	Revision 5
4.2	Sections 2, 3 and 5	Oct 09/07	Oct 10/07	Revision 5
5.1	Section 2	Oct 19/07	Apr 10/08	Revision 6
5.2	Sections 3, 4, 5 and Supplement 1	Oct 25/07	Apr 10/08	Revision 6
5.3	Section 4 and Supplement 4	Dec 18/07	Apr 10/08	Revision 6
5.4	Section 1 and Supplements 1 and 7	Dec 28/07	Apr 10/08	Revision 6
5.5	Section 4, Supplement 5 and Appendix 1	Jan 18/08	Apr 10/08	Revision 6
6.1	Sections 1, 3, Supplements 1 and 8	Jul 21/08	Nov 10/08	Revision 7
6.2	Sections 2, 5, Supplements 4	Oct 31/08	Nov 10/08	Revision 7
7.1	Section 4	Apr 02/09	Jul 02/09	Revision 8
8.1	Section 1, Supplement 4	Sep 28/09	Apr 08/10	Revision 9

RECORD OF TEMPORARY REVISIONS (AFM–1385)

TR N°	APPLICABILITY	DATE ISSUED	DATE REMOVED	INCORPORATED BY
8.2	Section 2	Nov 06/09	Apr 08/10	Revision 9
8.3	Supplement 1	Nov 25/09	Apr 08/10	Revision 9
10.1	Supplement 1	Sep 03/10	Sep 08/11	Revision 11
10.2	Sections 1, 2	Feb 20/11	Sep 08/11	Revision 11
11.1	Supplement 4	Nov 30/12	Jun 03/13	Revision 12
11.2	Section 2	Apr 09/13	Jun 03/13	Revision 12
12.1	Section 5, Supplements 1, 5, 8, and 11	Nov 07/13	Mar 14/14	Revision 13
12.2	Appendix 1	Nov 25/13	Mar 14/14	Revision 13
12.3	Supplement 4	Dec 06/13	Mar 14/14	Revision 13
13.1	Section 3, Appendix 1	Jul 07/14	Apr 29/15	Revision 14
13.2	Section 3, Supplement 1	Nov 20/14	Apr 29/15	Revision 14
14.1	Section 2	Jun 01/15	Oct 03/16	Revision 15
14.2	Section 4	Sep 08/15	Oct 03/16	Revision 15
14.3	Section 2	Dec 09/15	Oct 03/16	Revision 15
14.4	Supplement 1	Feb 19/16	Oct 03/16	Revision 15
14.5	Sections 1, 3, Supplements 4, 10, 12, and 13	Jul 04/16	Oct 03/16	Revision 15

INTENTIONALLY BLANK

LIST OF EFFECTIVE PAGES

ORIGINAL	0	FEB 20, 2004
REVISION	1	MAR 05, 2004
REVISION	2	MAY 14, 2004
REVISION	3	MAY 03, 2005
REVISION	4	MAY 02, 2007
REVISION	5	OCT 10, 2007
REVISION	6	APR 10, 2008
REVISION	7	NOV 10, 2008
REVISION	8	JUL 02, 2009
REVISION	9	APR 08, 2010
REVISION	10	AUG 16, 2010
REVISION	11	SEP 08, 2011
REVISION	12	JUN 03, 2013
REVISION	13	MAR 14, 2014
REVISION	14	APR 29, 2015
REVISION	15	OCT 03, 2016

INTENTIONALLY BLANK

Block	Code	Page			Change	Applicability (model, engine, authority, other)
0-TITLE	003	**cover**	*		REVISION 15	170 LR/SE/SU 175 LR
RA	01	1	*	**new**	REVISION 15	CC 01
RA	01	2	*	**new**	REVISION 15	
RA	01	3	*	**new**	REVISION 15	
RA	01	4	*	**new**	REVISION 15	
RA	01	5	*	**new**	REVISION 15	
RA	01	6	*	**new**	REVISION 15	
RA	01	7	*	**new**	REVISION 15	
RA	01	8	*	**new**	REVISION 15	
RA	01	9	*	**new**	REVISION 15	
RA	01	10	*	**new**	REVISION 15	
RA	01	11	*	**new**	REVISION 15	
RA	01	12	*	**new**	REVISION 15	
0-LOR	01	1	*	**del**	REVISION 15	CC 01
0-LOR	01	2	*	**del**	REVISION 15	
0-LOR	01	3	*	**del**	REVISION 15	
0-LOR	01	4	*	**del**	REVISION 15	
0-LOR	01	5	*	**del**	REVISION 15	
0-LOR	01	6	*	**del**	REVISION 15	
0-LOR	01	7	*	**del**	REVISION 15	
0-LOR	01	8	*	**del**	REVISION 15	
0-LOR	01	9	*	**del**	REVISION 15	
0-LOR	01	10	*	**del**	REVISION 15	
0-LOR	01	11	*	**del**	REVISION 15	
0-LOR	01	12	*	**del**	REVISION 15	
0-LOR	01	13	*	**del**	REVISION 15	
0-LOR	01	14	*	**del**	REVISION 15	
0-LOR	01	15	*	**del**	REVISION 15	
0-LOR	01	16	*	**del**	REVISION 15	
0-LOR	01	17	*	**del**	REVISION 15	
0-LOR	01	18	*	**del**	REVISION 15	
0-LOR	01	19	*	**del**	REVISION 15	
0-LOR	01	20	*	**del**	REVISION 15	
0-LOR	01	21	*	**del**	REVISION 15	

* Asterisk indicates pages revised, added or deleted by the current revision.

Block	Code	Page			Change	Applicability (model, engine, authority, other)
0-LOR	01	22	*	del	REVISION 15	
0-LOR	01	23	*	del	REVISION 15	
0-LOR	01	24	*	del	REVISION 15	
RTR	01	1			REVISION 14	CC 01
RTR	01	2			REVISION 14	
RTR	01	3	*		REVISION 15	
RTR	01	4			REVISION 14	
0-LEP	003	1	*		REVISION 15	CC 003
0-LEP	003	2	*		REVISION 15	
0-LEP	003	3	*		REVISION 15	
0-LEP	003	4	*		REVISION 15	
0-LEP	003	5	*		REVISION 15	
0-LEP	003	6	*		REVISION 15	
0-LEP	003	7	*		REVISION 15	
0-LEP	003	8	*		REVISION 15	
0-LEP	003	9	*		REVISION 15	
0-LEP	003	10	*		REVISION 15	
0-LEP	003	11	*		REVISION 15	
0-LEP	003	12	*		REVISION 15	
0-LEP	003	13	*		REVISION 15	
0-LEP	003	14	*		REVISION 15	
0-LEP	003	15	*		REVISION 15	
0-LEP	003	16	*		REVISION 15	
0-TOC	01	1			REVISION 3	ALL
0-TOC	01	2			ORIGINAL	
1-00	01	1	*		REVISION 15	ALL
1-00	01	2	*		REVISION 15	
1-00	01	3	*		REVISION 15	
1-00	01	4	*		REVISION 15	
1-00	01	5	*	new	REVISION 15	
1-00	01	6	*	new	REVISION 15	
1-10	01	1	*		REVISION 15	ALL
1-10	01	2	*		REVISION 15	
1-20	01	1	*		REVISION 15	ALL

* Asterisk indicates pages revised, added or deleted by the current revision.

Block	Code	Page			Change	Applicability (model, engine, authority, other)
1-20	01	2	*		REVISION 15	
1-20	01	3	*		REVISION 15	
1-20	01	4	*		REVISION 15	
1-20	01	5	*		REVISION 15	
1-20	01	6	*		REVISION 15	
1-20	01	7	*	**new**	REVISION 15	
1-20	01	8	*	**new**	REVISION 15	
2-00	01	1			REVISION 13	ALL
2-00	01	2			ORIGINAL	
2-05	02	1			REVISION 8	170 LR/lb
2-05	02	2			REVISION 13	
2-05	03	1			REVISION 8	170 SE/lb
2-05	03	2			REVISION 13	
2-05	04	1			REVISION 8	170 SU/lb
2-05	04	2			REVISION 13	
2-05	11	1			REVISION 8	175 LR/lb
2-05	11	2			REVISION 13	
2-05	20	1			REVISION 7	175 all models/lb
2-05	20	2			REVISION 13	Post-Mod SB 170-00-0016
2-06	01	1			REVISION 13	170 lb
2-06	01	2			REVISION 13	Standard CG
2-06	01	3			REVISION 13	
2-06	01	4			REVISION 13	
2-06	03	1			REVISION 13	175, except EWT - lb
2-06	03	2			REVISION 13	Standard CG
2-06	05	1			REVISION 13	170 lb
2-06	05	2			REVISION 13	Alternate CG
2-06	05	3			REVISION 13	
2-06	05	4			REVISION 13	
2-06	11	1			REVISION 13	175 EWT lb - CF34-8E5
2-06	11	2			REVISION 13	Standard CG
2-10	01	1	*		REVISION 15	170 + 8000 ft
2-10	01	2	*		REVISION 15	
2-10	01	3	*		REVISION 15	

* Asterisk indicates pages revised, added or deleted by the current revision.

Block	Code	Page		Change	Applicability (model, engine, authority, other)
2-10	01	4	*	REVISION 15	
2-10	01	5	*	REVISION 15	
2-10	01	6	*	REVISION 15	
2-10	03	1	*	REVISION 15	175 + 8000 ft
2-10	03	2	*	REVISION 15	
2-10	03	3	*	REVISION 15	
2-10	03	4	*	REVISION 15	
2-10	03	5	*	REVISION 15	
2-10	03	6	*	REVISION 15	
2-20	01	1		REVISION 4	ALL
2-20	01	2		REVISION 4	
2-30	01	1		ORIGINAL	ALL
2-30	01	2		ORIGINAL	
2-36	01	1	*	REVISION 15	170/175 STD/LR/SU
2-36	01	2	*	REVISION 15	US Gal and lb
2-38	01	1		REVISION 6	ALL
2-38	01	2		ORIGINAL	
2-40	02	1	*	REVISION 15	CF34-8E5
2-40	02	2	*	REVISION 15	
2-40	02	3	*	REVISION 15	
2-40	02	4	*	REVISION 15	
2-48	01	1	*	REVISION 15	ALL
2-48	01	2	*	REVISION 15	
2-50	01	1	*	REVISION 15	ALL
2-50	01	2	*	REVISION 15	
2-56	01	1		REVISION 12	ALL
2-56	01	2		REVISION 12	
2-58	01	1		ORIGINAL	ALL
2-58	01	2		ORIGINAL	
2-58	01	3		ORIGINAL	
2-58	01	4		ORIGINAL	
3-00	01	1		REVISION 14	ALL
3-00	01	2		REVISION 14	
3-00	01	3		REVISION 14	

* Asterisk indicates pages revised, added or deleted by the current revision.

Block	Code	Page		Change	Applicability (model, engine, authority, other)
3-00	01	4		REVISION 14	
3-03	01	1		REVISION 14	ALL
3-03	01	2		REVISION 14	
3-05	01	1	*	REVISION 15	ALL
3-05	01	2	*	REVISION 15	
3-07	01	1		REVISION 3	ALL
3-07	01	2		REVISION 3	
3-09	01	1	*	REVISION 15	ALL
3-09	01	2	*	REVISION 15	
3-09	01	3	*	REVISION 15	
3-09	01	4	*	REVISION 15	
3-11	01	1		REVISION 14	ALL
3-11	01	2		REVISION 14	
3-13	01	1	*	REVISION 15	ALL
3-13	01	2	*	REVISION 15	
3-15	01	1	*	REVISION 15	ALL
3-15	01	2	*	REVISION 15	
3-16	01	1	*	REVISION 15	ALL
3-16	01	2	*	REVISION 15	
3-17	01	1		REVISION 6	ALL
3-17	01	2		ORIGINAL	
3-19	01	1	*	REVISION 15	ALL
3-19	01	2	*	REVISION 15	
3-21	01	1	*	REVISION 15	ALL
3-21	01	2	*	REVISION 15	
3-23	01	1		ORIGINAL	ALL
3-23	01	2		ORIGINAL	
3-25	01	1		ORIGINAL	ALL
3-25	01	2		ORIGINAL	
3-27	01	1		ORIGINAL	ALL
3-27	01	2		ORIGINAL	
3-29	01	1		REVISION 4	ALL
3-29	01	2		ORIGINAL	

* Asterisk indicates pages revised, added or deleted by the current revision.

Block	Code	Page		Change	Applicability (model, engine, authority, other)
3-31	01	1		ORIGINAL	ALL
3-31	01	2		ORIGINAL	
3-33	01	1		ORIGINAL	ALL
3-33	01	2		ORIGINAL	
3-35	01	1		ORIGINAL	ALL
3-35	01	2		ORIGINAL	
3-37	01	1		ORIGINAL	ALL
3-37	01	2		ORIGINAL	
3-39	01	1		ORIGINAL	ALL
3-39	01	2		ORIGINAL	
3-40	01	1		REVISION 4	ALL
3-40	01	2		REVISION 4	
3-41	01	1	*	REVISION 15	ALL
3-41	01	2	*	REVISION 15	
3-43	01	1		REVISION 3	ALL
3-43	01	2		REVISION 7	
4-00	01	1		ORIGINAL	ALL
4-00	01	2		ORIGINAL	
4-00	01	3		ORIGINAL	
4-00	01	4		ORIGINAL	
4-01	01	1	*	REVISION 15	ALL
4-01	01	2	*	REVISION 15	
4-01	01	3	*	REVISION 15	
4-01	01	4	*	REVISION 15	
4-01	01	5	*	REVISION 15	
4-01	01	6	*	REVISION 15	
4-01	01	7	*	REVISION 15	
4-01	01	8	*	REVISION 15	
4-01	01	9	*	REVISION 15	
4-01	01	10	*	REVISION 15	
4-01	01	11	*	REVISION 15	
4-01	01	12	*	REVISION 15	
4-01	01	13	*	REVISION 15	
4-01	01	14	*	REVISION 15	

* Asterisk indicates pages revised, added or deleted by the current revision.

Block	Code	Page			Change	Applicability (model, engine, authority, other)
4-01	01	15	*		REVISION 15	
4-01	01	16	*		REVISION 15	
4-01	01	17	*		REVISION 15	
4-01	01	18	*		REVISION 15	
4-01	01	19	*		REVISION 15	
4-01	01	20	*		REVISION 15	
4-01	01	21	*		REVISION 15	
4-01	01	22	*		REVISION 15	
4-01	01	23	*	**del**	REVISION 15	
4-01	01	24	*	**del**	REVISION 15	
4-02	01	1			REVISION 4	ALL
4-02	01	2			ORIGINAL	
4-02	01	3			ORIGINAL	
4-02	01	4			REVISION 4	
4-02	01	5			REVISION 3	
4-02	01	6			REVISION 3	
4-04	01	1	*		REVISION 15	ALL
4-04	01	2	*		REVISION 15	
4-04	01	3	*		REVISION 15	
4-04	01	4	*		REVISION 15	
4-04	01	5	*		REVISION 15	
4-04	01	6	*		REVISION 15	
4-04	01	7	*		REVISION 15	
4-04	01	8	*		REVISION 15	
4-06	01	1	*		REVISION 15	ALL
4-06	01	2	*		REVISION 15	
4-06	01	3	*		REVISION 15	
4-06	01	4	*		REVISION 15	
4-06	01	5	*		REVISION 15	
4-06	01	6	*		REVISION 15	
4-08	01	1			REVISION 6	ALL
4-08	01	2			ORIGINAL	
4-08	01	3			REVISION 6	
4-08	01	4			ORIGINAL	

* Asterisk indicates pages revised, added or deleted by the current revision.

Block	Code	Page			Change	Applicability (model, engine, authority, other)
4-10	01	1	*		REVISION 15	ALL
4-10	01	2	*		REVISION 15	
4-10	01	3	*		REVISION 15	
4-10	01	4	*		REVISION 15	
4-10	01	5	*		REVISION 15	
4-10	01	6	*		REVISION 15	
4-10	01	7	*		REVISION 15	
4-10	01	8	*		REVISION 15	
4-10	01	9	*		REVISION 15	
4-10	01	10	*		REVISION 15	
4-10	01	11	*	**del**	REVISION 15	
4-10	01	12	*	**del**	REVISION 15	
4-12	01	1	*		REVISION 15	ALL
4-12	01	2	*		REVISION 15	
4-12	01	3	*		REVISION 15	
4-12	01	4	*		REVISION 15	
4-12	01	5	*		REVISION 15	
4-12	01	6	*		REVISION 15	
4-12	01	7	*		REVISION 15	
4-12	01	8	*		REVISION 15	
4-14	01	1	*		REVISION 15	ALL
4-14	01	2	*		REVISION 15	
4-14	01	3	*		REVISION 15	
4-14	01	4	*		REVISION 15	
4-16	01	1	*		REVISION 15	ALL
4-16	01	2	*		REVISION 15	
4-16	01	3	*		REVISION 15	
4-16	01	4	*		REVISION 15	
4-16	01	5	*		REVISION 15	
4-16	01	6	*		REVISION 15	
4-16	01	7	*		REVISION 15	
4-16	01	8	*		REVISION 15	
4-16	01	9	*		REVISION 15	
4-16	01	10	*		REVISION 15	

* Asterisk indicates pages revised, added or deleted by the current revision.

Block	Code	Page			Change	Applicability (model, engine, authority, other)
4-16	01	11	*	**del**	REVISION 15	
4-16	01	12	*	**del**	REVISION 15	
4-18	01	1	*		REVISION 15	ALL
4-18	01	2	*		REVISION 15	
4-18	01	3	*		REVISION 15	
4-18	01	4	*		REVISION 15	
4-18	01	5	*		REVISION 15	
4-18	01	6	*		REVISION 15	
4-18	01	7	*		REVISION 15	
4-18	01	8	*		REVISION 15	
4-18	01	9	*		REVISION 15	
4-18	01	10	*		REVISION 15	
4-18	01	11	*		REVISION 15	
4-18	01	12	*		REVISION 15	
4-18	01	13	*	**del**	REVISION 15	
4-18	01	14	*	**del**	REVISION 15	
4-20	01	1	*		REVISION 15	ALL
4-20	01	2	*		REVISION 15	
4-20	01	3	*		REVISION 15	
4-20	01	4	*		REVISION 15	
4-20	01	5	*		REVISION 15	
4-20	01	6	*		REVISION 15	
4-22	01	1			REVISION 3	ALL
4-22	01	2			ORIGINAL	
4-22	01	3			ORIGINAL	
4-22	01	4			REVISION 3	
4-22	01	5			REVISION 3	
4-22	01	6			REVISION 3	
4-24	01	1	*		REVISION 15	ALL
4-24	01	2	*		REVISION 15	
4-24	01	3	*		REVISION 15	
4-24	01	4	*		REVISION 15	
4-24	01	5	*		REVISION 15	
4-24	01	6	*		REVISION 15	

* Asterisk indicates pages revised, added or deleted by the current revision.

Block	Code	Page		Change	Applicability (model, engine, authority, other)
4-26	01	1	*	REVISION 15	ALL
4-26	01	2	*	REVISION 15	
4-26	01	3	*	REVISION 15	
4-26	01	4	*	REVISION 15	
4-26	01	5	*	REVISION 15	
4-26	01	6	*	REVISION 15	
4-28	01	1		ORIGINAL	ALL
4-28	01	2		ORIGINAL	
4-28	01	3		ORIGINAL	
4-28	01	4		ORIGINAL	
4-30	01	1	*	REVISION 15	ALL
4-30	01	2	*	REVISION 15	
4-30	01	3	*	REVISION 15	
4-30	01	4	*	REVISION 15	
4-30	01	5	*	REVISION 15	
4-30	01	6	*	REVISION 15	
4-30	01	7	*	REVISION 15	
4-30	01	8	*	REVISION 15	
5-00	01	1		REVISION 6	ALL
5-00	01	2		REVISION 4	
5-01	01	1		ORIGINAL	ALL
5-01	01	2		REVISION 2	
5-01	01	3		REVISION 2	
5-01	01	4		REVISION 2	
5-01	01	5		REVISION 2	
5-01	01	6		REVISION 13	
5-01	01	7		REVISION 8	
5-01	01	8		REVISION 2	
5-01	01	9		REVISION 2	
5-01	01	10		REVISION 6	
5-01	01	11		REVISION 6	
5-01	01	12		REVISION 6	
5-01	01	13		REVISION 6	
5-01	01	14		REVISION 6	

* Asterisk indicates pages revised, added or deleted by the current revision.

Block	Code	Page		Change	Applicability (model, engine, authority, other)
5-01	01	15		REVISION 6	
5-01	01	16		REVISION 6	
5-01	01	17		REVISION 6	
5-01	01	18		REVISION 6	
5-01	01	19		REVISION 6	
5-01	01	20		REVISION 6	
5-01	01	21		REVISION 8	
5-01	01	22		REVISION 6	
5-03	02	1		REVISION 5	170 – CF34-8E5
5-03	02	2		REVISION 12	
5-03	02	3		REVISION 12	
5-03	02	4		REVISION 12	
5-03	04	1		REVISION 12	175 – CF34-8E5
5-03	04	2		REVISION 12	
5-03	05	1		REVISION 12	175 - CF34-8E5
5-03	05	2		REVISION 12	Post-Mod SB 170-00-0016
5-05	01	1		ORIGINAL	ALL
5-05	01	2		ORIGINAL	
5-05	01	3		ORIGINAL	
5-05	01	4		ORIGINAL	
S-TOC	02	1	*	REVISION 15	No optionals
S-TOC	02	2	*	REVISION 15	
S1-00	01	1		REVISION 4	CAFM for 170 + 175
S1-00	01	2		REVISION 4	
S1-02	01	1		REVISION 11	ALL
S1-02	01	2		ORIGINAL	
S1-05	02	1		REVISION 14	170 – CF34-8E5
S1-05	02	2		REVISION 14	CAFM-170-FAA-002 VERSION 11.0
S1-05	05	1		REVISION 14	175 – CF34-8E5
S1-05	05	2		REVISION 14	CAFM-175-FAA-002 VERSION 7.0
S1-05	07	1	* **new**	REVISION 15	175 EWT – CF34-8E5
S1-05	07	2	* **new**	REVISION 15	CAFM-175-FAA-006 VERSION 7.1
S1-10	01	1		ORIGINAL	ALL

* Asterisk indicates pages revised, added or deleted by the current revision.

Block	Code	Page		Change	Applicability (model, engine, authority, other)
S1-10	01	2		ORIGINAL	
S1-15	01	1		REVISION 9	ALL
S1-15	01	2		ORIGINAL	
S4-00	01	1	*	REVISION 15	Primus Epic FMS
S4-00	01	2	*	REVISION 15	
S4-00	01	3	*	REVISION 15	
S4-00	01	4	*	REVISION 15	
S4-00	01	5	*	REVISION 15	
S4-00	01	6	*	REVISION 15	
S4-05	01	1	*	REVISION 15	Primus Epic FMS
S4-05	01	2	*	REVISION 15	
S4-05	01	3	*	REVISION 15	
S4-05	01	4	*	REVISION 15	
S4-05	01	5	*	REVISION 15	
S4-05	01	6	*	REVISION 15	
S4-05	01	7	*	REVISION 15	
S4-05	01	8	*	REVISION 15	
S4-10	01	1	*	REVISION 15	Primus Epic FMS
S4-10	01	2	*	REVISION 15	
S4-10	01	3	*	REVISION 15	
S4-10	01	4	*	REVISION 15	
S4-10	01	5	*	REVISION 15	
S4-10	01	6	*	REVISION 15	
S4-10	01	7	*	REVISION 15	
S4-10	01	8	*	REVISION 15	
S4-10	01	8A	*	REVISION 15	
S4-10	01	8B	*	REVISION 15	
S4-10	01	9	*	REVISION 15	
S4-10	01	10	*	REVISION 15	
S4-10	01	11	*	REVISION 15	
S4-10	01	12	*	REVISION 15	
S4-10	01	13	*	REVISION 15	
S4-10	01	14	*	REVISION 15	
S5-00	01	1		REVISION 6	CAT II Operation

* Asterisk indicates pages revised, added or deleted by the current revision.

Block	Code	Page		Change	Applicability (model, engine, authority, other)
S5-00	01	2		REVISION 6	
S5-00	01	3		REVISION 6	
S5-00	01	4		REVISION 6	
S5-00	01	5		REVISION 6	
S5-00	01	6		ORIGINAL	
S5-05	01	1		REVISION 6	CAT II Operation
S5-05	01	2		REVISION 6	
S5-10	01	1	*	REVISION 15	CAT II Operation
S5-10	01	2	*	REVISION 15	
S5-10	01	3	*	REVISION 15	
S5-10	01	4	*	REVISION 15	
S5-10	01	5	*	REVISION 15	
S5-10	01	6	*	REVISION 15	
S5-10	01	7	*	REVISION 15	
S5-10	01	8	*	REVISION 15	
S6-00	01	1		ORIGINAL	RVSM Operation
S6-00	01	2		ORIGINAL	
S6-05	01	1	*	REVISION 15	RVSM Operation
S6-05	01	2	*	REVISION 15	
S6-10	01	1	*	REVISION 15	RVSM Operation
S6-10	01	2	*	REVISION 15	
S6-10	01	3	*	REVISION 15	
S6-10	01	4	*	REVISION 15	
AP-TOC	01	1		REVISION 3	CDL + Noise
AP-TOC	01	2		REVISION 2	
AP1-00	01	1		REVISION 14	CDL
AP1-00	01	2		REVISION 14	
AP1-00	01	3		REVISION 14	
AP1-00	01	4		REVISION 14	
AP1-23	01	1		REVISION 6	CDL
AP1-23	01	2		REVISION 3	
AP1-28	01	1		REVISION 4	CDL
AP1-28	01	2		REVISION 4	
AP1-32	01	1		REVISION 14	CDL

* Asterisk indicates pages revised, added or deleted by the current revision.

Block	Code	Page	Change	Applicability (model, engine, authority, other)
AP1-32	01	2	REVISION 14	
AP1-33	01	1	REVISION 14	CDL
AP1-33	01	2	REVISION 14	
AP1-34	01	1	REVISION 14	CDL
AP1-34	01	2	REVISION 14	
AP1-38	01	1	REVISION 14	CDL
AP1-38	01	2	REVISION 14	
AP1-52	01	1	REVISION 6	CDL
AP1-52	01	2	REVISION 4	
AP1-53	01	1	REVISION 14	CDL
AP1-53	01	2	REVISION 14	
AP1-53	01	3	REVISION 14	
AP1-53	01	4	REVISION 14	
AP1-55	01	1	REVISION 14	CDL
AP1-55	01	2	REVISION 14	
AP1-55	01	3	REVISION 14	
AP1-55	01	4	REVISION 14	
AP1-57	01	1	REVISION 14	CDL
AP1-57	01	2	REVISION 14	
AP1-71	01	1	REVISION 14	CDL
AP1-71	01	2	REVISION 14	
AP1-78	01	1	REVISION 14	CDL
AP1-78	01	2	REVISION 14	
AP2-00	01	1	REVISION 2	170 Supplemental Noise
AP2-00	01	2	REVISION 2	
AP2-10	01	1	REVISION 4	170 Supplemental Noise
AP2-10	01	2	REVISION 2	

* Asterisk indicates pages revised, added or deleted by the current revision.

TABLE OF CONTENTS

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 1

GENERAL

TABLE OF CONTENTS

INTRODUCTION

This Airplane Flight Manual (AFM) meets the certification requirements set by FAR 25 and provides the approved information necessary to safely operate the EMBRAER 170 and EMBRAER 175.

For additional information, please contact:

EMBRAER S.A.
Flight Operations Engineering & Support
Av. Brigadeiro Faria Lima, 2170 - PC 176
São José dos Campos - São Paulo - BRASIL
CEP 12227-901
PHONE: 55 12 3927-1706
E-MAIL: opereng@embraer.com.br

REVISIONS

EMBRAER may periodically revise this manual as required to update information or provide information not available at the time of printing. Revised data may result from EMBRAER approved airplane modifications or from improved techniques gained through operational experience.

The basic and current issue date of this Manual is presented on the title page. The revisions to the basic Manual will be numbered sequentially (Rev. 1, 2, 3 and so forth). The issue date correspondent to each revision is presented on the beginning of the List of Effective Pages. The revision status of each page is informed at the List of Effective Pages and on the page footer.

A Log of Revisions, at the beginning of this manual, shows the approval date and authority signature, as well as a brief description of modifications.

TEMPORARY REVISIONS

Temporary revisions (TR) may be issued when a change is required before the normal revision. TR pages are yellow colored and must be inserted alongside the affected white pages (do not replace them). They will be clearly identified by a numeric character composed by the latest revision number followed by a dot number. Example: TR 14.3.

The issue date correspondent to each revision is presented on the beginning of the TR List of Effective Pages. The revision status of each page is informed at the TR List of Effective Pages and on the TR page footer.

TR contents are to be incorporated in the next Revision. TR yellow pages are removed upon incorporation of next Revision pages.

A Log of Temporary Revisions, just after the Log of Revisions, lists the TR pages and the respective description of modifications.

CHANGE MARKINGS

Changes to the text are indicated by a vertical line on the outer margin of the page at the height of affected lines.

A vertical line, adjacent to the page number, indicates either the following changes:

- relocated text or illustrations,
- entire new supplement, or section, or block.

Change markings are only applied to changes included at the time of approval.

LISTS OF EFFECTIVE PAGES

A List of Effective Pages and a TR List of Effective Pages, at the beginning of this Manual, present the revision status of each page of this Manual. Their purpose is to allow verification of Manual updating.

CONFIGURATION RELEASE

Customer AFM is an extract of Authority-approved AFM, customized for specific fleet configuration, identified by three last numbers after manual Part Number.

Configuration Release is a change on Customer AFM contents due to modifications on airplane optional equipment or operation.

Configuration Release will be identified on manual cover and on the List of Effective Pages by an alphanumeric character composed by the latest revision number followed by a dash and an alphabetic letter.
Example: Release 12-A, Release 14.3-A...
The sequential letter is reinitiated on every next Revision for each Customer AFM.

Both cover and LEP (of normal and temporary revision) must be replaced with those transmitted by the configuration release, and the content pages inserted or removed accordingly.

ORGANIZATION

This Airplane Flight Manual is divided into seven Sections, as follows:

- Section 1 - General
- Section 2 - Limitations
- Section 3 - Normal Procedures
- Section 4 - Emergency and Abnormal Procedures
- Section 5 - Performance
- Supplements
- Appendices

The Sections and their use are explained below.

SECTION 1 - GENERAL

This Section contains general information pertaining to the Manual, such as the revision rules, its organization and a definition of terms.

SECTION 2 - LIMITATIONS

This Section contains airworthiness certification limitations.

The limitations restrict airplane operation in accordance with the airworthiness certificate.

SECTION 3 - NORMAL PROCEDURES

This Section contains the required normal procedures.

SECTION 4 - EMERGENCY AND ABNORMAL PROCEDURES

This Section contains the actions in the event of failures.

SECTION 5 - PERFORMANCE

This section contains performance general information and configurations.

SUPPLEMENTS

The Supplements provide the necessary additional information for the airplane operation, when equipped with optional systems and equipment not provided with the standard airplane, or when specific operational information is applicable to the airplane (e.g. ferry flights, special operation etc). Supplements may modify or complete the limitations, procedures or performance data of the basic AFM.

APPENDICES

Appendices may be incorporated in the AFM to provide additional information for the operation of the airplane, in a format that may not be the same as the basic AFM.

GUIDANCE INFORMATION

Some portions of the AFM are provided as guidance information and were not applied for a certification process, being presented in the AFM for the operator convenience. Such portions are presented in segregated Sections, Supplements or Appendices, and their pages do not bear the notation "ANAC APPROVED".

DEFINITION OF TERMS

The following definitions apply to the terms below:

WARNING: OPERATING PROCEDURES, TECHNIQUES AND OTHER RELATED INFORMATION WHICH MAY RESULT IN PERSONAL INJURY OR LOSS OF LIFE, IF NOT FOLLOWED.

CAUTION: OPERATING PROCEDURES, TECHNIQUES AND OTHER RELATED INFORMATION WHICH MAY RESULT IN DAMAGE OR DESTRUCTION OF EQUIPMENT, IF NOT FOLLOWED.

NOTE: Operating procedures, techniques and other related information which are considered essential to emphasize.

INTENTIONALLY BLANK

ABBREVIATIONS AND ACRONYMS USED

ABBREVIATIONS OR ACRONYMS	MEANING
°C	Degree Celsius
°F	Degree Fahrenheit
ft	Feet
kg	Kilogram
kt	Knot
lb	Pounds
m	Meter
psi	Pound per Square Inch
sec	Second
∆Gust	Increase in Airspeed due to Gust
A	Ampere
AC	Alternating Current
ACARS	Aircraft Communication Addressing and Reporting System
ADF	Automatic Direction Finder
ADS	Air Data System
ADS-B	Automatic Dependant Surveillance Broadcast
AEO	All Engines Operating
AFE	Above Field Elevation
AFM	Airplane Flight Manual
AGL	Above Ground Level
A/I	Anti-Ice
AMS	Air Management System
AOA	Angle of Attack
AP or A/P	Autopilot
APU	Auxiliary Power Unit
ARM	Armed
ASD	Accelerate Stop Distance

ABBREVIATIONS OR ACRONYMS	MEANING
ASDA	Accelerate Stop Distance Available
ATC	Air Traffic Control
ATS	Air Turbine Starter
ATTCS	Automatic Takeoff Thrust Control System
AVNX	Avionics
BRK	Brake
CAFM	Computerized Airplane Flight Manual
CAT II	Category II Operation
CB	Circuit Breaker
CCD	Cursor Control Device
CDI	Course Deviation Indicator
CG	Center of Gravity
COMM	Communication
CON	Continuous
CR or CRZ	Cruise
CRG	Cargo
CVR	Cockpit Voice Recorder
DC	Direct Current, Digital Controller
DET	Detector
DH	Decision Height
DISAG	Disagree
DME	Distance Measurement Equipment
DVDR	Digital Voice Data Recorder
EADI	Electronic Attitude Director Indicator
ECS	Environmental Control System
EGPWS	Enhanced Ground Proximity Warning System
EGT	Exhaust Gas Temperature
EICAS	Engine Indication and Crew Alerting System
EMG or EMERG	Emergency

ABBREVIATIONS OR ACRONYMS	MEANING
ENG	Engine
ESS	Essential
FAA	Federal Aviation Authority
FADEC	Full Authority Digital Electronic Control
FAF	Final Approach Fix
FANS	Future Air Navigation System
FIREX	Fire Extinguisher
FLEX	Flexible
FMS	Flight Management System
FPA	Flight Path Angle
FPL	Flight Path Level
FWD	Forward
GA or G/A	Go Around
GE	General Electric
GMT	Greenwich Mean Time
GPS	Global Positioning System
GPS/SBAS	GPS with SBAS Capability
GPU	Ground Power Unit
G/S, GS	Glide Slope
HDG	Heading
HF	High Frequency
HI	High
IAF	Initial Approach Fix
ICAO	International Civil Aviation Organization
IDG	Integrated Driven Generator
IESS	Integrated Electronic Standby System
IFR	Instrument Flight Rules
ILS	Instrument Landing System
IRS	Inertial Reference System
IRU	Inertial Reference Unit
ISA	International Standard Atmosphere

ABBREVIATIONS OR ACRONYMS	MEANING
ITT	Interturbine Temperature
KIAS	Indicated Airspeed in Knots
LDA	Localizer Directional Aid
LG	Landing Gear
LNAV	Lateral Navigation
LO	Low
LOC	Localizer
LPV	Localizer Performance with Vertical Guidance
LR	Long Range
LT	Light
M	Mach
MAC	Mean Aerodynamic Chord
MAN	Manual
MAU	Modular Acquisition Unit
MAX	Maximum
MCDU	Multi-Function Control Display Unit
MEA	Minimum Enroute Altitude
MFD	Multifunction Display
MIN	Minimum
MLS	Microwave Landing System
MLW	Maximum Landing Weight
M_{MO}	Maximum Operating Mach
M_{RA}	Maximum Turbulent Air Penetration Speed (Mach)
MRB	Maintenance Review Board
MRW	Maximum Ramp Weight
MTOW	Maximum Takeoff Weight
MXR	Maximum Reserve
N1	Fan Speed
N2	High Pressure Rotor Shaft Speed

ABBREVIATIONS OR ACRONYMS	MEANING
NAV	Navigation
NAVCOM	Navigation & Communication
NDB	Non-Directional Beacon
NG FMS	Next Generation Flight Management System
NM	Nautical Miles
NOTAM	Notice to Airmen
OEI	One Engine Inoperative
OVHT	Overheat
PAX	Passenger
QFE	Atmospheric Pressure at Airport Elevation
RA	Radio Altimeter, Resolution Advisory
RAIM	GPS Receiver Integrity Monitoring
RAT	Ram Air Turbine
RF	Radius to a Fix
RLW	Regulated Landing Weight
RNAV	Area Navigation System
RNP	Required Navigation Performance
RNP AR	Required Navigation Performance Authorization Required
RPM	Revolution Per Minute
RTO	Rejected Takeoff
RTOW	Regulated Takeoff Weight
RVSM	Reduced Vertical Separation Minimum
SAT	Static Air Temperature
SDF	Simplified Directional Monitoring
SOV	Shutoff Valve
STD	Standard
TA	Traffic Advisory
TAT	Total Air Temperature
TCAS	Traffic and Collision Avoidance System

ABBREVIATIONS OR ACRONYMS	MEANING
TLA	Thrust Lever Angle
TO	Takeoff
TOD	Takeoff Distance
TODA	Takeoff Distance Available
TOGA	Takeoff/Go-Around
TORA	Takeoff Runway Available
TRU	Transformer Rectifier Unit
V	Volt
V_2	Takeoff Safety Speed
VA	Volt-Ampere
V_A	Design Maneuvering Speed
V_{APP}	Approach Speed
V_{AC}	Approach Climb Speed
V_{EF}	Critical Engine Failure Speed
V_{FE}	Maximum Flaps Extended Speed
VFR	Visual Flight Rules
V_{FS}	Final Segment Speed
VHF	Very High Frequency
V_{LE}	Maximum Landing Gear Extended Speed
VLF	Very Low Frequency
V_{LO}	Maximum Landing Gear Operating Speed
V_{LOF}	Lift Off Speed
V_{MBE}	Maximum Brake energy Speed
V_{MCA}	Minimum Control Speed in the Air
V_{MCG}	Minimum Control Speed on Ground
V_{MCL}	Minimum Control Speed During Landing
V_{MO}	Maximum Operating Speed
V_{MU}	Minimum Unstick Speed
VNAV	Vertical Navigation Mode
VOR	VHF Omnidirectional Range

ABBREVIATIONS OR ACRONYMS	MEANING
V_R	Rotation Speed
V_{RA}	Maximum Turbulent Air Penetration Speed
V_{REF}	Landing Reference Speed

INTENTIONALLY BLANK

SECTION 2

LIMITATIONS

TABLE OF CONTENTS

INTRODUCTION

This airplane must be operated in accordance with the limitations presented in this Section. These limitations also apply to operations in accordance with an approved Supplement or Appendix to this AFM, except as altered by such Supplement or Appendix.

WEIGHT

AIRPLANE MODEL	MAX Ramp Weight (MRW) (lb)	MAX Takeoff Weight (MTOW) (lb)	MAX Landing Weight (MLW) (lb)	MAX Zero Fuel Weight (MZFW) (lb)
EMBRAER 170 LR	82364	82011	72310	65256 (1)

NOTE: 1) For airplanes S/N 170-0059, 170-0065 and on, or Post-Mod. SB170-00-0024, the MZFW is 66446 lb.

To comply with the performance and operating limitations of the regulations, the maximum allowable takeoff and landing operational weights may be equal to, but not greater than design limits.

The takeoff weight (weight at brake release or at start of takeoff run) is the lowest between MTOW and the following weights:

- Maximum takeoff weight as calculated using the approved software, and as limited by field length, climb and brake energy.
- Maximum takeoff weight, as limited by enroute, and landing operating requirements.

The landing weight is the lowest among MLW and the following weights calculated using the approved software:

- Maximum landing weight as limited by runway.
- Maximum approach and landing weight as limited by altitude, temperature and climb gradient.

LOADING

The airplane must be loaded in accordance with the information contained in the Weight and Balance Manual.

DELETED

WEIGHT

AIRPLANE MODEL	MAX Ramp Weight (MRW) (lb)	MAX Takeoff Weight (MTOW) (lb)	MAX Landing Weight (MLW) (lb)	MAX Zero Fuel Weight (MZFW) (lb)
EMBRAER 170 SE	82364	82011	72310	65256 (1)

NOTE: 1) For airplanes S/N 170-0059, 170-0065 and on, or Post-Mod. SB170-00-0024, the MZFW is 66446 lb.

To comply with the performance and operating limitations of the regulations, the maximum allowable takeoff and landing operational weights may be equal to, but not greater than design limits.

The takeoff weight (weight at brake release or at start of takeoff run) is the lowest between MTOW and the following weights:

- Maximum takeoff weight as calculated using the approved software, and as limited by field length, climb and brake energy.
- Maximum takeoff weight, as limited by enroute, and landing operating requirements.

The landing weight is the lowest among MLW and the following weights calculated using the approved software:

- Maximum landing weight as limited by runway.
- Maximum approach and landing weight as limited by altitude, temperature and climb gradient.

LOADING

The airplane must be loaded in accordance with the information contained in the Weight and Balance Manual.

DELETED

WEIGHT

AIRPLANE MODEL	MAX Ramp Weight (MRW) (lb)	MAX Takeoff Weight (MTOW) (lb)	MAX Landing Weight (MLW) (lb)	MAX Zero Fuel Weight (MZFW) (lb)
EMBRAER 170 SU	82364	82011	72310	65256 (1)

NOTE: 1) For airplanes S/N 170-0059, 170-0065 and on, or Post-Mod. SB170-00-0024, the MZFW is 66446 lb.

To comply with the performance and operating limitations of the regulations, the maximum allowable takeoff and landing operational weights may be equal to, but not greater than design limits.

The takeoff weight (weight at brake release or at start of takeoff run) is the lowest between MTOW and the following weights:

- Maximum takeoff weight as calculated using the approved software, and as limited by field length, climb and brake energy.
- Maximum takeoff weight, as limited by enroute, and landing operating requirements.

The landing weight is the lowest among MLW and the following weights calculated using the approved software:

- Maximum landing weight as limited by runway.
- Maximum approach and landing weight as limited by altitude, temperature and climb gradient.

LOADING

The airplane must be loaded in accordance with the information contained in the Weight and Balance Manual.

DELETED

WEIGHT

AIRPLANE MODEL	MAX Ramp Weight (MRW) (lb)	MAX Takeoff Weight (MTOW) (lb)	MAX Landing Weight (MLW) (lb)	MAX Zero Fuel Weight (MZFW) (lb)
EMBRAER 175 LR	85870	85517	74957	69886

To comply with the performance and operating limitations of the regulations, the maximum allowable takeoff and landing operational weights may be equal to, but not greater than design limits.

The takeoff weight (weight at brake release or at start of takeoff run) is the lowest between MTOW and the following weights:

- Maximum takeoff weight as calculated using the approved software, and as limited by field length, climb and brake energy.
- Maximum takeoff weight, as limited by enroute, and landing operating requirements.

The landing weight is the lowest among MLW and the following weights calculated using the approved software:

- Maximum landing weight as limited by runway.
- Maximum approach and landing weight as limited by altitude, temperature and climb gradient.

LOADING

The airplane must be loaded in accordance with the information contained in the Weight and Balance Manual.

DELETED

WEIGHT

AIRPLANE MODEL	MAX Ramp Weight (MRW) (lb)	MAX Takeoff Weight (MTOW) (lb)	MAX Landing Weight (MLW) (lb)	MAX Zero Fuel Weight (MZFW) (lb)
EMBRAER 175-STD (1) **EMBRAER 175-SU (1)** **EMBRAER 175-LR (1)**	89352	89000	75177	70547

NOTE: (1) For airplanes Post-Mod. SB 170-00-0016 or equipped with an equivalent modification factory incorporated.

To comply with the performance and operating limitations of the regulations, the maximum allowable takeoff and landing operational weights may be equal to, but not greater than design limits.

The takeoff weight (weight at brake release or at start of takeoff run) is the lowest between MTOW and the following weights:

- Maximum takeoff weight as calculated using the approved software, and as limited by field length, climb and brake energy.
- Maximum takeoff weight, as limited by enroute, and landing operating requirements.

The landing weight is the lowest among MLW and the following weights calculated using the approved software:

- Maximum landing weight as limited by runway.
- Maximum approach and landing weight as limited by altitude, temperature and climb gradient.

LOADING

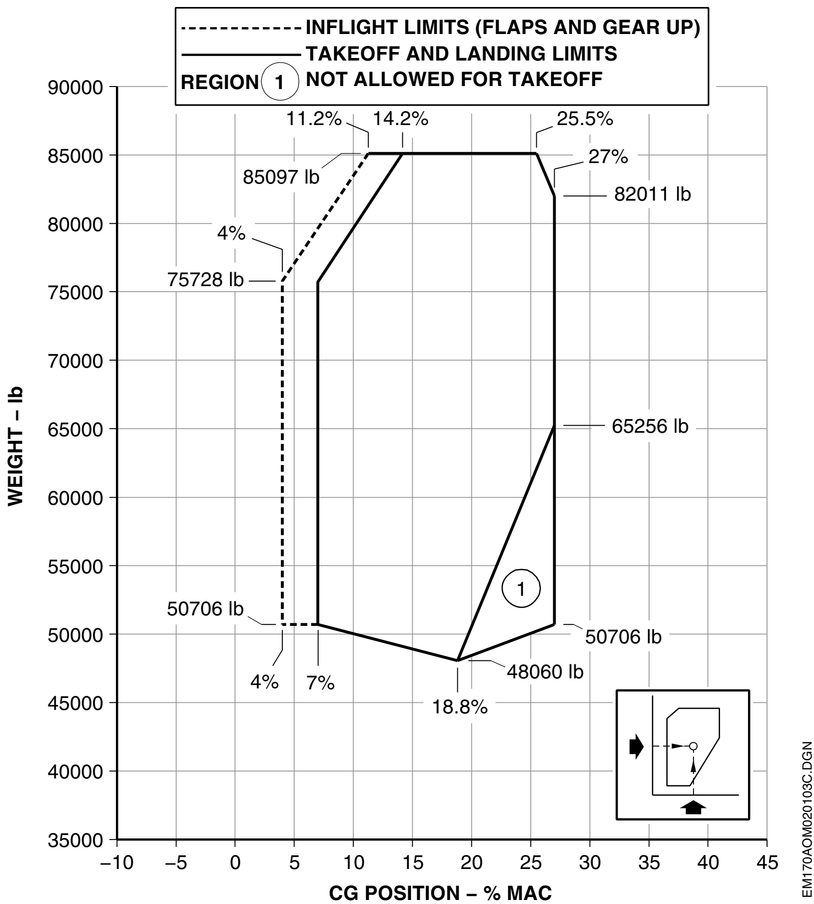
The airplane must be loaded in accordance with the information contained in the Weight and Balance Manual.

DELETED

CENTER OF GRAVITY ENVELOPE

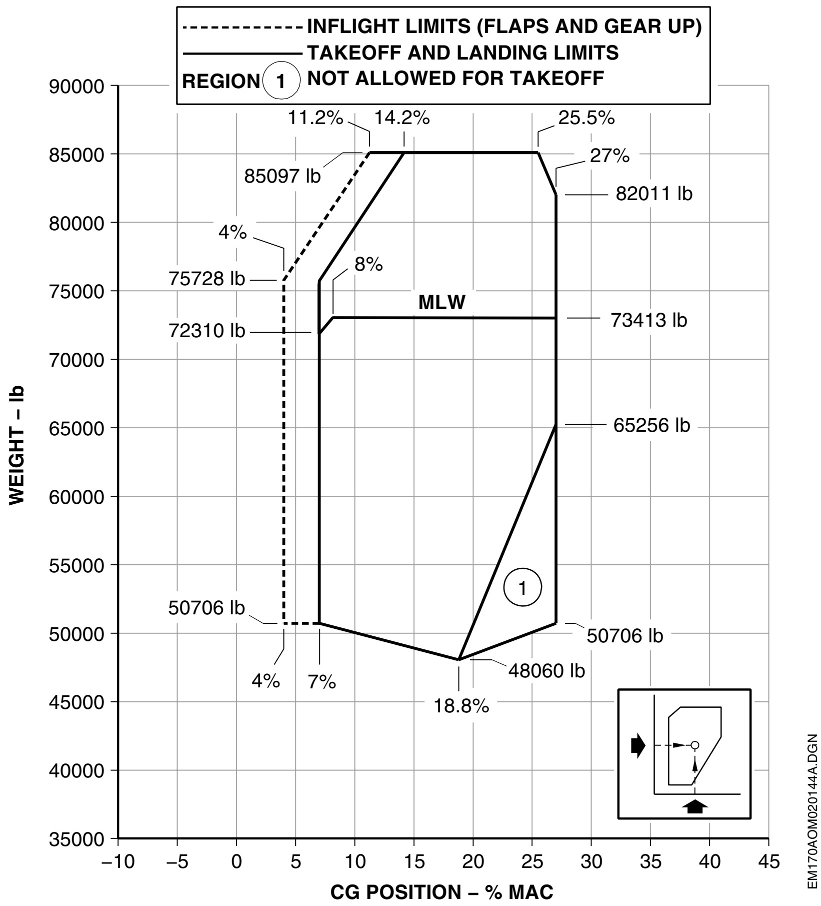
EMBRAER 170 STANDARD, LR, SE AND SU MODELS PRE-MOD SB 170-00-0003 AND PRE-MOD 170-00-0016

NOTE: The data below must be used in conjunction with the maximum weight values (ramp, takeoff, landing and zero fuel) associated to each model and found in the Maximum Weight table.



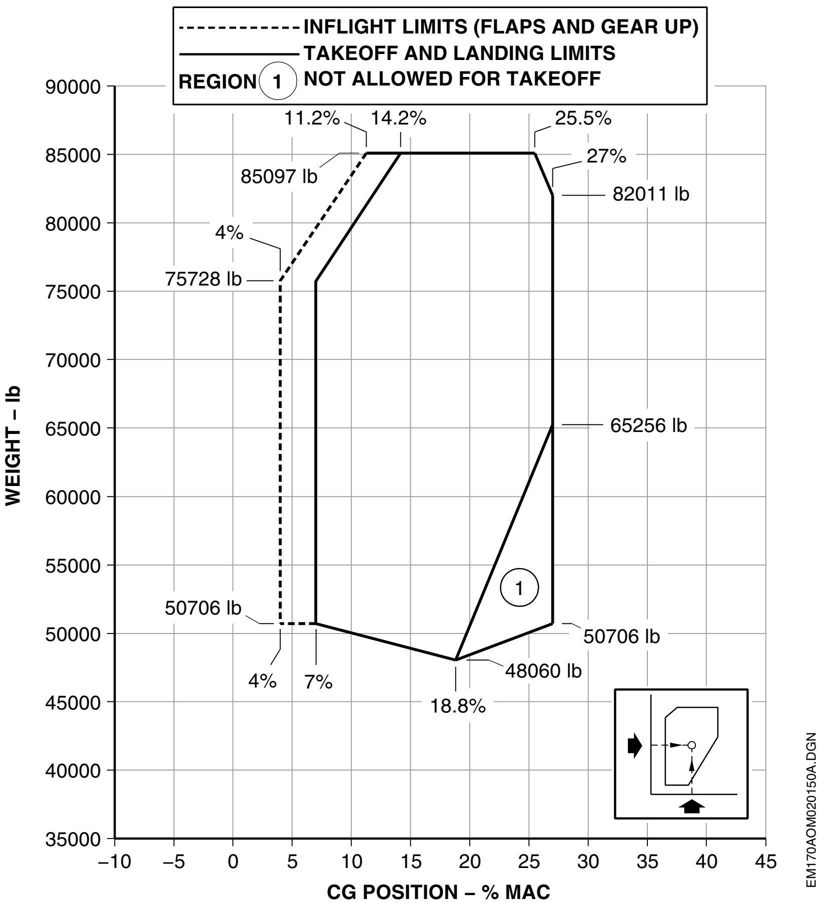
EMBRAER 170 STANDARD, LR, SE AND SU MODELS POST-MOD SB 170-00-0003 OR EQUIPPED WITH AN EQUIVALENT MODIFICATION FACTORY INCORPORATED AND PRE-MOD SB 170-00-0016

NOTE: The data below must be used in conjunction with the maximum weight values (ramp, takeoff, landing and zero fuel) associated to each model and found in the Maximum Weight table.



EMBRAER 170 STANDARD, LR, SE AND SU MODELS POST-MOD SB 170-00-0016 OR EQUIPPED WITH AN EQUIVALENT MODIFICATION FACTORY INCORPORATED

NOTE: The data below must be used in conjunction with the maximum weight values (ramp, takeoff, landing and zero fuel) associated to each model and found in the Maximum Weight table.

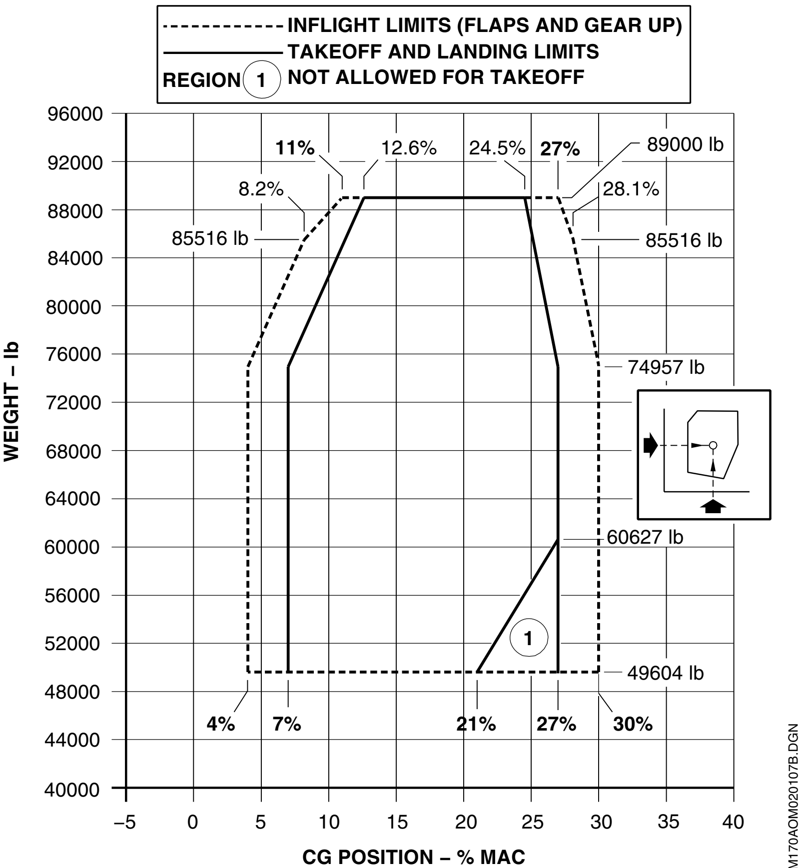


INTENTIONALLY BLANK

CENTER OF GRAVITY ENVELOPE

EMBRAER 175 STANDARD, LR AND SU MODELS

NOTE: The data below must be used in conjunction with the maximum weight values (ramp, takeoff, landing and zero fuel) associated to each model and found in the Maximum Weight table.

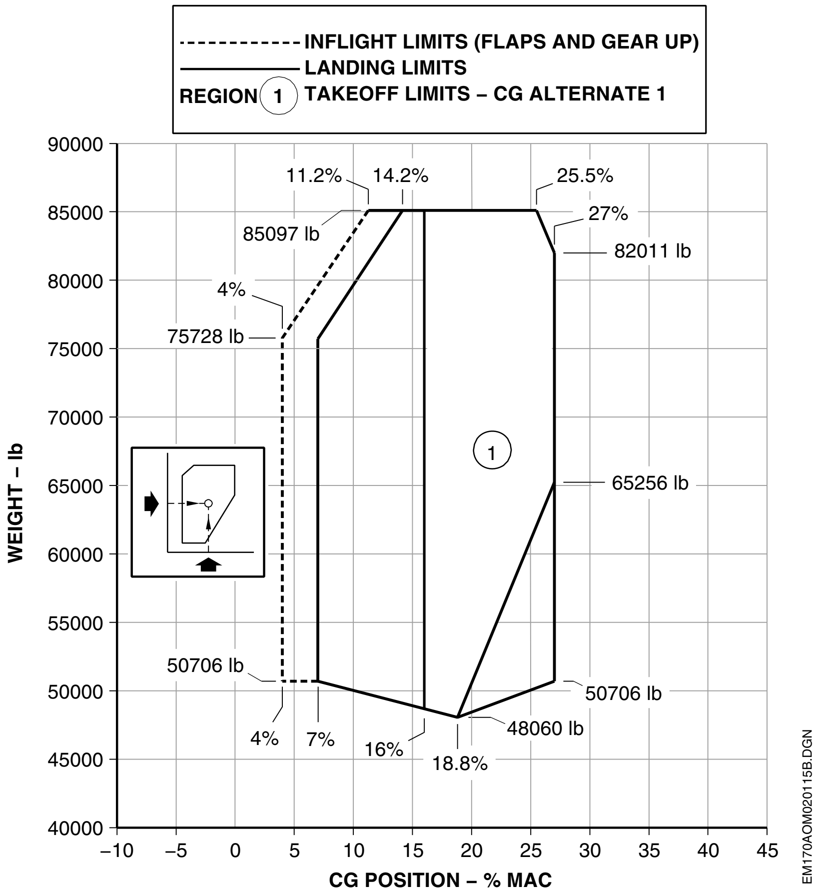


INTENTIONALLY BLANK

CENTER OF GRAVITY ENVELOPE
(ALTERNATE 1 – CENTER OF GRAVITY – 16%)

EMBRAER 170 STANDARD, LR, SE AND SU MODELS PRE-MOD SB 170-00-0003 AND PRE-MOD SB 170-00-0016

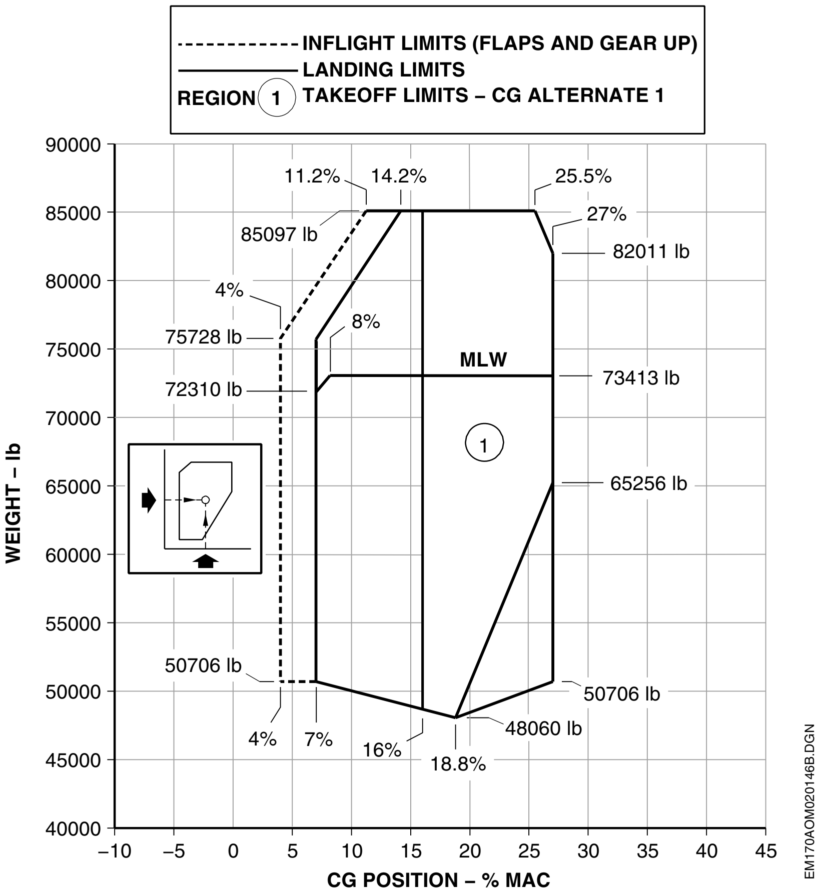
NOTE: The data below must be used in conjunction with the maximum weight values (ramp, takeoff, landing and zero fuel) associated to each model and found in the Maximum Weight table.



NOTE: The CAFM CG Envelope option must be set to Alternate 1 for takeoff.

EMBRAER 170 STANDARD, LR, SE AND SU MODELS POST-MOD SB 170-00-0003 OR EQUIPPED WITH AN EQUIVALENT MODIFICATION FACTORY INCORPORATED AND PRE-MOD SB 170-00-0016

NOTE: The data below must be used in conjunction with the maximum weight values (ramp, takeoff, landing and zero fuel) associated to each model and found in the Maximum Weight table.

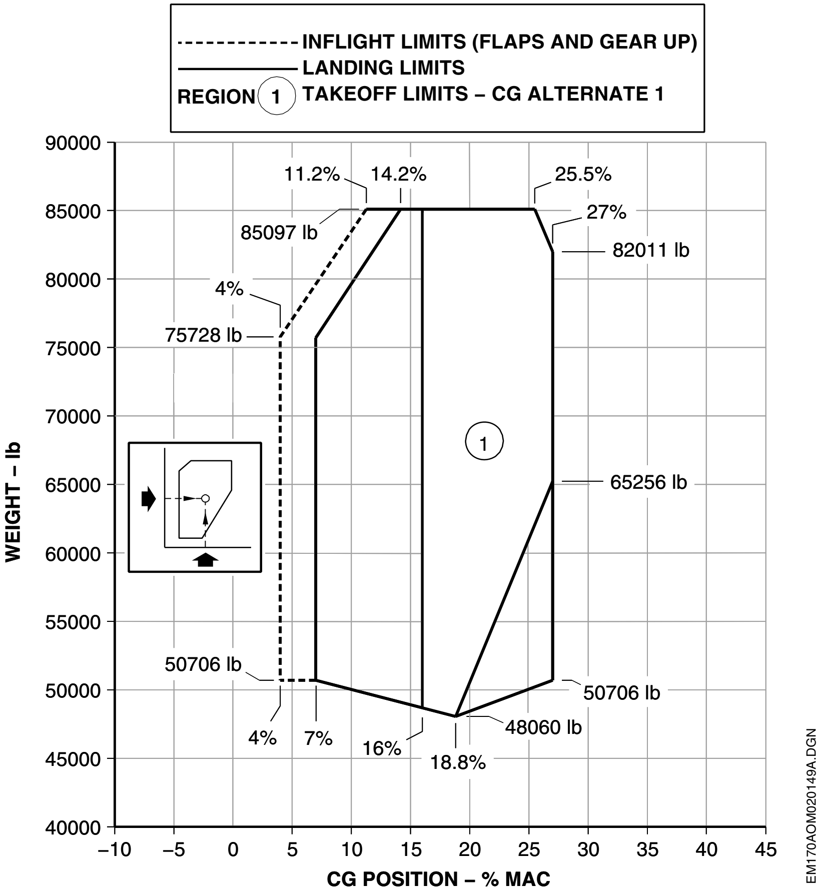


NOTE: The CAFM CG Envelope option must be set to Alternate 1 for takeoff.

AFM-1385

EMBRAER 170 STANDARD, LR, SE AND SU MODELS POST-MOD SB 170-00-0016 OR EQUIPPED WITH AN EQUIVALENT MODIFICATION FACTORY INCORPORATED

NOTE: The data below must be used in conjunction with the maximum weight values (ramp, takeoff, landing and zero fuel) associated to each model and found in the Maximum Weight table.



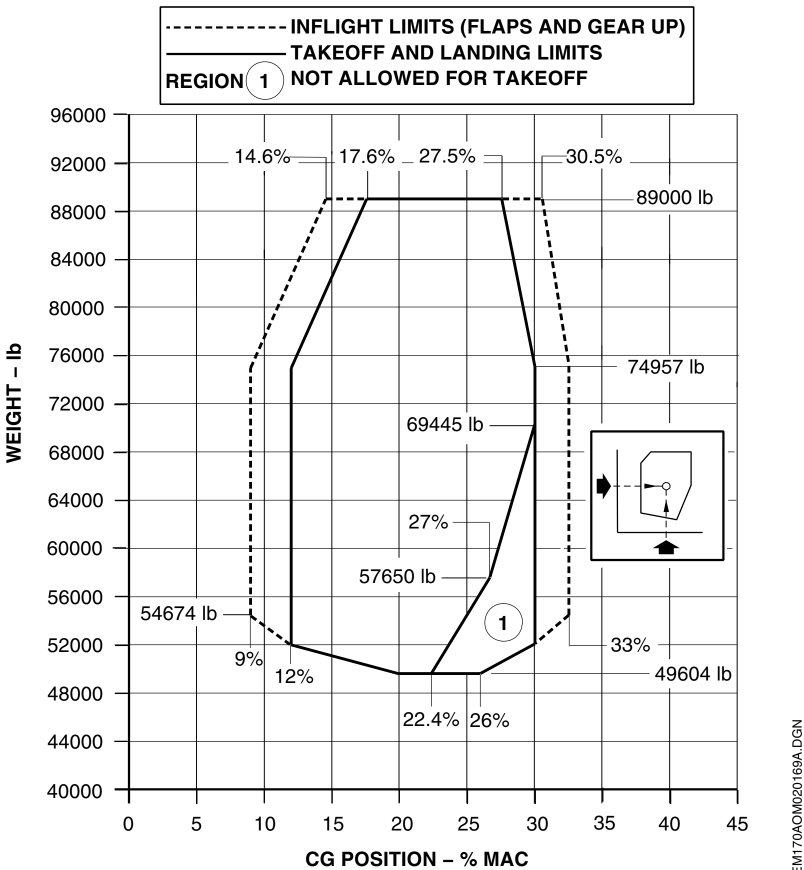
NOTE: The CAFM CG Envelope option must be set to Alternate 1 for takeoff.

INTENTIONALLY BLANK

CENTER OF GRAVITY ENVELOPE

EMBRAER 175 STANDARD, LR AND SU MODELS - CF34-8E5 ENGINES - POST-MOD SB 170-57-0058 (ENHANCED WING TIP) OR WITH AN EQUIVALENT FACTORY MODIFICATION

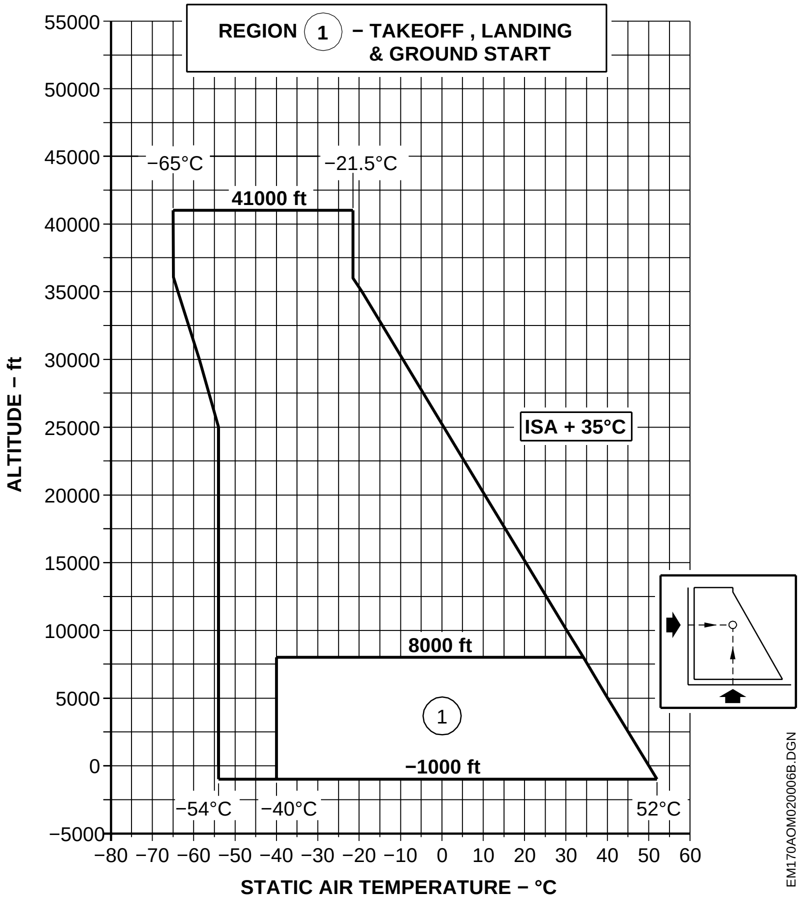
NOTE: The data below must be used in conjunction with the maximum weight values (ramp, takeoff, landing and zero fuel) associated to each model and found in the Maximum Weight table.



INTENTIONALLY BLANK

OPERATIONAL LIMITATIONS

OPERATIONAL ENVELOPE



NOTE: In the event of a landing below -40°C, the airplane may not takeoff without further maintenance inspection.

MAXIMUM ALTITUDE FOR FLAP EXTENDED

Maximum Altitude For Flap Extension .... 20000 ft

AIRSPEEDS

LANDING GEAR OPERATION/EXTENDED SPEED (V_{LO} AND V_{LE})

V_{LO} for retraction.. 250 KIAS

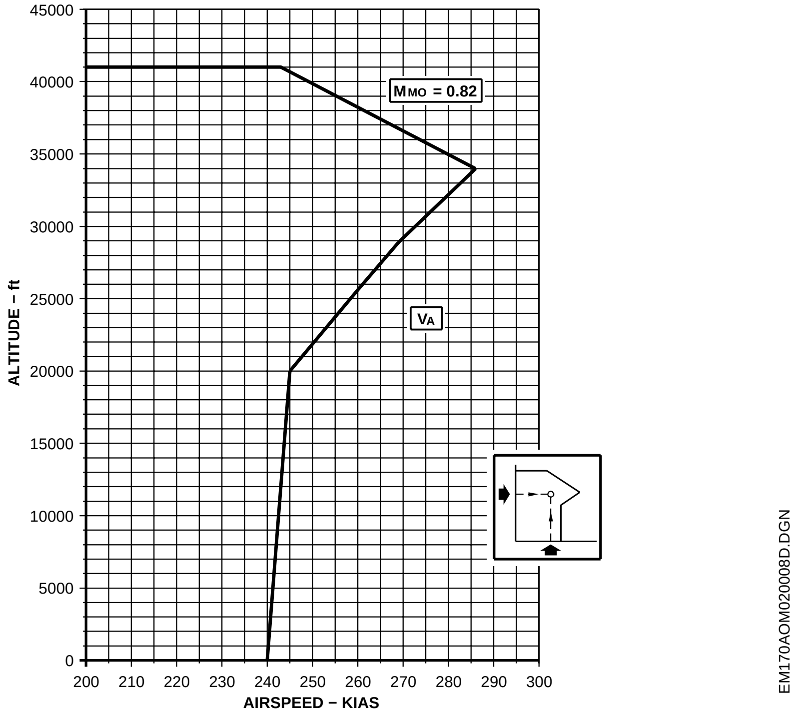
V_{LO} for extension .... 250 KIAS

V_{LE} .... 250 KIAS

NOTE: - V_{LO} is the maximum speed at which the landing gear can be safely extended and retracted.

- V_{LE} is the maximum speed at which the airplane can be safely flown with the landing gear extended and locked.

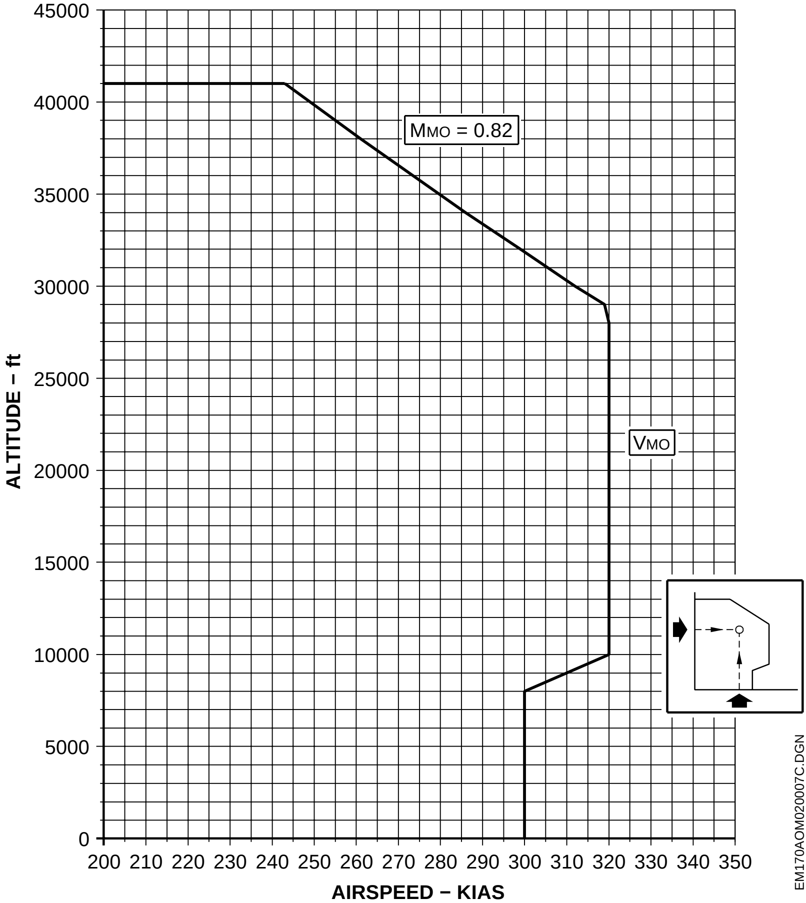
MANEUVERING SPEED (V_A)



NOTE: Maneuvers that involve angle of attack near the stall or full application of rudder, elevator, and aileron controls should be confined to speeds below V_A. In addition, the maneuvering flight load factor limits, presented in this Section, should not be exceeded.

CAUTION: RAPID AND LARGE ALTERNATING CONTROL INPUTS, ESPECIALLY IN COMBINATION WITH LARGE CHANGES IN PITCH, ROLL, OR YAW (E.G. LARGE SIDE SLIP ANGLES) MAY RESULT IN STRUCTURAL FAILURES AT ANY SPEED, EVEN BELOW V_A.

MAXIMUM OPERATING SPEED



NOTE: V_{MO}/M_{MO} may not be deliberated exceeded in any regime of flight (climb, cruise, or descent).

MAXIMUM FLAP EXTENDED SPEED (V_{FE})

Flaps 1 .... 230 KIAS
Flaps 2 .... 215 KIAS
Flaps 3 .... 200 KIAS
Flaps 4 .... 180 KIAS
Flaps 5 .... 180 KIAS
Flaps Full .... 165 KIAS

MAXIMUM TIRE GROUND SPEED

Maximum Tire Ground Speed .... 195 kt

MINIMUM CONTROL SPEEDS

The minimum control speeds are presented by the CAFM outputs associated to the takeoff flaps and engine models.

SPEED TO OPEN THE DIRECT VISION WINDOW

Maximum Speed... 160 KIAS

WIND LIMITATIONS

Maximum Takeoff and Landing Tailwind Component .. 10 kt

KINDS OF OPERATION

This airplane may be flown day and night in the following conditions, when the appropriate equipment and instruments required by airworthiness and operating regulations are approved, installed and in an operable condition:

- Visual (VFR).
- Instrument (IFR).
- Icing conditions.
- Category I and II.
- RVSM.
- Extended Over-Water Operation.

MINIMUM CREW

Minimum Flight Crew .... PILOT AND COPILOT

MANEUVERING FLIGHT LOAD FACTORS

These corresponding accelerations limit the bank angle during turns and limit the pull-up maneuvers.

LOAD FACTOR LIMIT	FLAPS UP	FLAPS DOWN (1, 2, 3, 4, 5 AND FULL)
Positive	2.5 g	2.0 g
Negative	-1.0 g	0 g

RUNWAY

Runway Slope .... -2% TO +2%

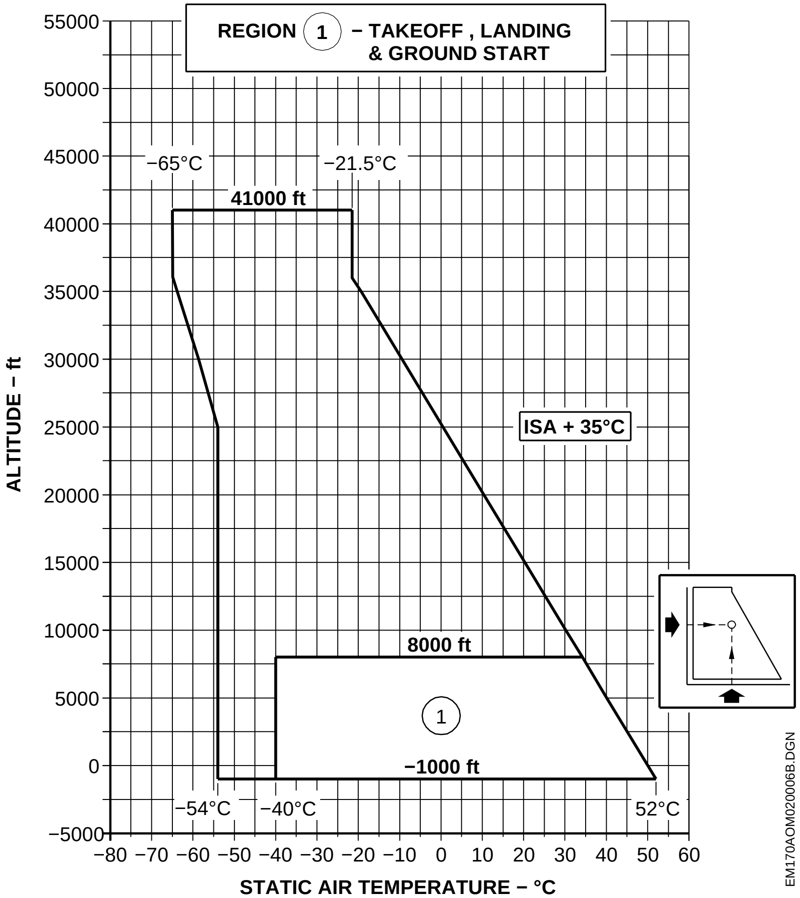
Runway Surface Type .... PAVED

TOWING

Towbarless towing is prohibited, unless it is conducted in accordance with the procedures presented in the AMM chapter 9.

OPERATIONAL LIMITATIONS

OPERATIONAL ENVELOPE



NOTE: In the event of a landing below -40°C, the airplane may not takeoff without further maintenance inspection.

MAXIMUM ALTITUDE FOR FLAP EXTENDED

Maximum Altitude For Flap Extension .... 20000 ft

AIRSPEEDS

LANDING GEAR OPERATION/EXTENDED SPEED (V_{LO} AND V_{LE})

V_{LO} for retraction... 250 KIAS

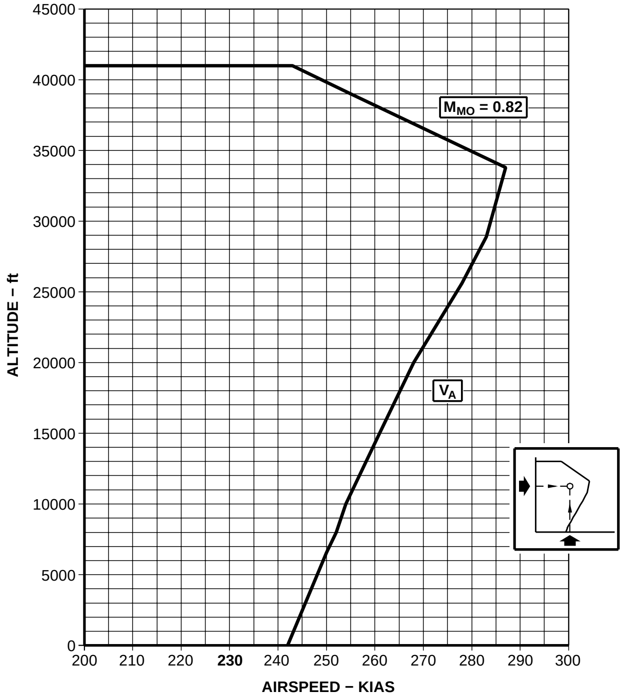
V_{LO} for extension .... 250 KIAS

V_{LE} .... 250 KIAS

NOTE: - V_{LO} is the maximum speed at which the landing gear can be safely extended and retracted.

- V_{LE} is the maximum speed at which the airplane can be safely flown with the landing gear extended and locked.

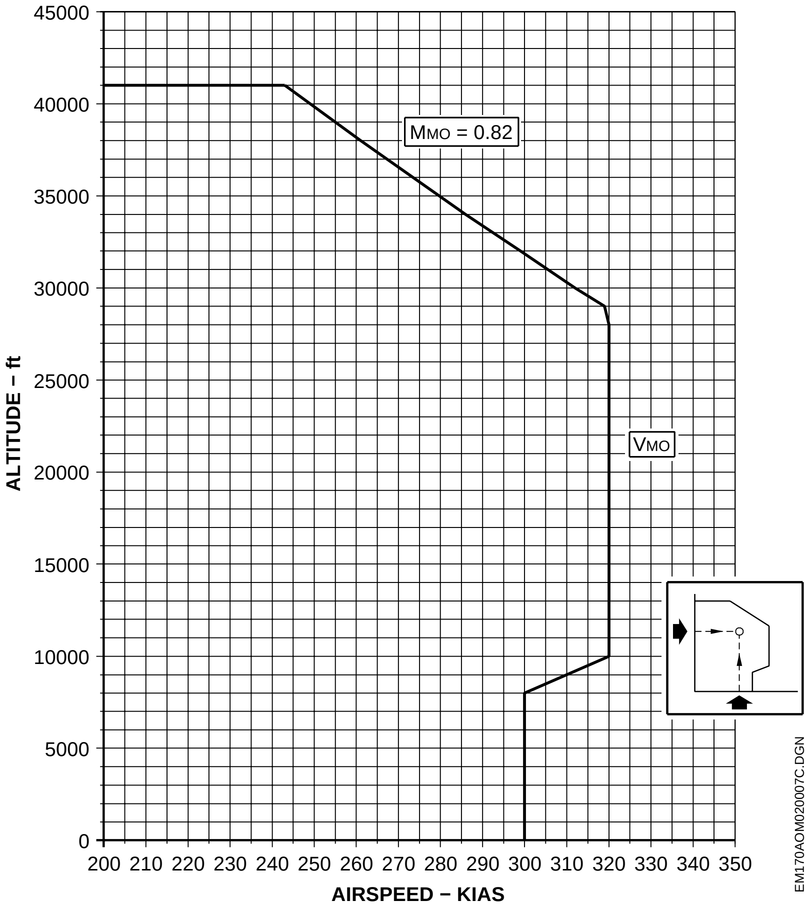
MANEUVERING SPEED (V_A)



NOTE: Maneuvers that involve angle of attack near the stall or full application of rudder, elevator, and aileron controls should be confined to speeds below V_A. In addition, the maneuvering flight load factor limits, presented in this Section, should not be exceeded.

CAUTION: RAPID AND LARGE ALTERNATING CONTROL INPUTS, ESPECIALLY IN COMBINATION WITH LARGE CHANGES IN PITCH, ROLL, OR YAW (E.G. LARGE SIDE SLIP ANGLES) MAY RESULT IN STRUCTURAL FAILURES AT ANY SPEED, EVEN BELOW V_A.

MAXIMUM OPERATING SPEED



NOTE: V_{MO}/M_{MO} may not be deliberated exceeded in any regime of flight (climb, cruise, or descent).

MAXIMUM FLAP EXTENDED SPEED (V_{FE})

Flaps 1 .... 230 KIAS
Flaps 2 .... 215 KIAS
Flaps 3 .... 200 KIAS
Flaps 4 .... 180 KIAS
Flaps 5 .... 180 KIAS
Flaps Full .... 165 KIAS

MAXIMUM TIRE GROUND SPEED

Maximum Tire Ground Speed .... 195 kt

MINIMUM CONTROL SPEEDS

The minimum control speeds are presented by the CAFM outputs associated to the takeoff flaps and engine models.

SPEED TO OPEN THE DIRECT VISION WINDOW

Maximum Speed... 160 KIAS

WIND LIMITATIONS

Maximum Takeoff and Landing Tailwind Component .. 10 kt

KINDS OF OPERATION

This airplane may be flown day and night in the following conditions, when the appropriate equipment and instruments required by airworthiness and operating regulations are approved, installed and in an operable condition:

- Visual (VFR).
- Instrument (IFR).
- Icing conditions.
- Category I and II.
- RVSM.
- Extended Overwater Operation.

MINIMUM CREW

Minimum Flight Crew .... PILOT AND COPILOT

MANEUVERING FLIGHT LOAD FACTORS

These corresponding accelerations limit the bank angle during turns and limit the pull-up maneuvers.

LOAD FACTOR LIMIT	FLAPS UP	FLAPS DOWN (1, 2, 3, 4, 5 AND FULL)
Positive	2.5 g	2.00 g
Negative	- 1.00 g	0 g

RUNWAY

Runway Slope .... -2% TO +2%

Runway Surface Type .... PAVED

TOWING

Towbarless towing is prohibited, unless it is conducted in accordance with the procedures presented in the AMM chapter 9.

ELECTRONIC DISPLAY SYSTEM

ELECTRONIC CHECKLIST

Operational approval is required in order to load database into the airplane and use the electronic checklist.

For airplanes Pre-Mod. SB 170-31-0019 or with an equivalent modification factory incorporated, the use of the Electronic Checklist is prohibited.

INTENTIONALLY BLANK

WARNING

ENHANCED GROUND PROXIMITY WARNING

The following limitations are applicable to the Enhanced Ground Proximity Warning System (EGPWS):

- Navigation is not to be predicated on the use of the Terrain Awareness Display.
- The use of predictive EGPWS functions should be manually inhibited when landing to an airport that is not in the airport database to avoid unwanted alerts.
- Pilots are authorized to deviate from their current Air Traffic Control (ATC) clearance to the extent necessary to comply with an EGPWS warning.
- The Terrain Display is intended to be used as a situational tool only and may not provide the accuracy and/or fidelity on which to solely base terrain avoidance maneuvering.
- The use of predictive EGPWS functions should be manually inhibited during QFE operations if GPS data is unavailable or inoperative.

TRAFFIC ALERT AND COLLISION AVOIDANCE

The following limitations are applicable to the Traffic Alert and Collision Avoidance System (TCAS):

- Deviation from the ATC assigned altitude is authorized only to extent necessary to comply with a TCAS Resolution Advisory (RA).
- Maneuvers must not be based solely on information presented in the traffic display.

THIS PAGE INTENTIONALLY LEFT BLANK

FUEL

AIRPLANE MODEL	EMBRAER 170/175
Maximum usable quantity per tank	1535.5 US Gal (10392.5 lb)
Unusable quantity per tank	11 US Gal (75 lb)

NOTE: Maximum fuel capacity is 3094 US Gal (20935 lb).

Maximum permitted imbalance between tanks .... 794 lb

NOTE: The weights above have been determined for an adopted fuel density of 6.767 lb/US Gal. Different fuel densities may be used provided the volumetric limits are not exceeded.

FUEL SPECIFICATION

Brazilian Specification.. QAV1
ASTM Specification .... D1655-JET A AND JET A-1
American Specification MIL-T-83133A-JP8

FUEL TANK TEMPERATURE

Minimum .... -37°C

CROSSFEED OPERATION

Crossfeed Selector Knob must be set OFF during takeoff and landing.

INTENTIONALLY BLANK

AUXILIARY POWER UNIT

SUNDSTRAND APS 2300

OPERATIONAL LIMITS

PARAMETER	MIN	MAX
START:	-	-
TEMPERATURE	-54°C	(3)
ALTITUDE	-	30000 ft
OPERATION:	-	-
TEMPERATURE	(3)	(3)
ALTITUDE:	-	33000 ft
ELECTRICAL GEN	-	33000 ft
BLEED	-	15000 ft
TO ASSIST ENGINE START	-	21000 ft
ROTOR SPEED	-	108%
EGT (1) (2):	-	-
START	-	1032°C
CONTINUOUS	-	717°C

NOTE: **1)** In flight, there is no automatic shutdown if EGT exceeds the limits.

2) There is no time limitation for operating the APU on ground or in flight in the amber range between 662°C and 717°C.

3) APU temperature matches the Airplane Operational Envelope temperature.

APU STARTER LIMITS

Cooling period after each starting attempt:

First and Second Attempts .... 60 sec OFF
Third Attempt .... 5 min OFF

INTENTIONALLY BLANK

POWER PLANT

ENGINES

Two General Electric CF34-8E5.

OPERATIONAL LIMITS

PARAMETER	MIN	MAX
N1	-	99.5%
N2	58.5%	99.4%
ITT:	-	-
Start	-	815°C
Normal Takeoff and Go Around	-	965°C (1) 949°C (2)
Maximum Takeoff and Go Around	-	1006°C (1) 990°C (2)
Maximum Continuous	-	960°C
OIL PRESSURE	25 psi	95 psi
OIL TEMPERATURE:	-	-
Continuous	-	155°C
Transient	-	163°C (3)

NOTE: **1)** Time limited to the first 2 minutes of the total 5 minutes limit.
2) Time limited to the remaining 3 minutes of the total 5 minutes limit.
3) Transient operation above 155°C limited to 15 minutes.

STARTER LIMITS

DRY MOTORING DUTY CYCLE LIMITS:

Motoring Number	Maximum Time	Cool-Down Time
1	90 Seconds	5 Minutes
2 through to 5 (1)	30 Seconds	5 Minutes

NOTE: 1) After five sequential motorings, cycle may be repeated following a 15-minute cool-down period.

STARTING DUTY CYCLE LIMITS:

Motoring Number	Maximum Time	Cool-Down Time
1 and 2	90 Seconds (On ground) 120 seconds (In-flight)	10 Seconds
3 through to 5	90 Seconds (On ground) 120 seconds (In-flight)	5 Minutes

NOTE:
- For ground starts, the maximum cumulative starter run time per start attempt is 90 seconds (monitoring plus start time).
- For in-flight starts, the maximum cumulative starter run time per start attempt is 120 seconds (monitoring plus start time).

ENGINE THRUST

Powerback is prohibited.

Operation at reduced takeoff thrust based on the assumed temperature higher than the actual ambient temperature is permissible if the airplane meets all applicable performance requirements at the planned takeoff weight and reduced thrust setting. The total thrust reduction must not exceed 25% of the full takeoff thrust. As a condition to the use of the reduced thrust procedures, operators must establish a means to ensure that the engines are capable of producing full takeoff thrust without exceeding any engine operating limits. Use of reduced takeoff thrust procedures is not allowed on runways contaminated with standing water, slush, snow, or ice, and are not allowed on wet runways unless suitable performance accountability is made for the increased stopping distance on the wet surface. Application of reduced takeoff thrust is always at the pilot discretion. When conducting a takeoff using reduced takeoff thrust, normal takeoff thrust may be selected at any time during the takeoff operation.

THRUST REVERSER (APPLICABLE ONLY TO AIRPLANES PRE-MOD. SB 170-73-003)

After applying thrust reverser, do not move the throttle back to the forward thrust range, unless the REV icon on the EICAS is shown in amber or green.

INTENTIONALLY BLANK

PNEUMATIC, AIR CONDITIONING AND PRESSURIZATION

PRESSURIZATION

Maximum differential pressure .... 8.4 psi
Maximum differential overpressure .... 8.8 psi
Maximum differential negative pressure....................... -0.5 psi
Maximum differential pressure for Takeoff
and Landing .... 0.2 psi

INTENTIONALLY BLANK

ICE AND RAIN PROTECTION

OPERATION IN ICING CONDITIONS

There is no temperature limitation for anti-icing system automatic operation.
On ground:

- The TO DATASET MENU on the MCDU must be set to ENG when OAT is from 5–10°C and:
  - if there is any possibility of encountering visible moisture up to 1700 ft AFE, or
  - when operating on ramps, taxiways, or runways where surface snow, ice, standing water, or slush may be ingested by the engines, or freeze on engines, nacelles, or engine sensor probes.
- The TO DATASET MENU on the MCDU must be set to ALL when OAT is less than 5°C:
  - if there is any possibility of encountering visible moisture up to 1700 ft AFE, or
  - when operating on ramps, taxiways, or runways where surface snow, ice, standing water, or slush may be ingested by the engines, or freeze on engines, nacelles, or engine sensor probes.

In flight:

- The engine and wing anti-ice systems operate automatically, in case of ice encounter when the ice protection mode selector is in the AUTO position. If either one or both ice detectors are failed, the crew must set the mode selector to ON when icing conditions exist or are anticipated below 10°C TAT with visible moisture.

NOTE: - Icing conditions may exist whenever the Outside Air Temperature (OAT) on ground or for takeoff, or Total Air Temperature (TAT) inflight, is 10°C or less and visible moisture in any form is present (such as clouds, fog with visibility of one mile or less, rain, snow, sleet, and ice crystals).

- Icing conditions may also exist when the OAT on ground or for takeoff is 10°C or less when operating on ramps, taxiways, or runways where surface snow, ice, standing water, or slush may be ingested by the engines, or freeze on engines, nacelles, or engine sensor probes.

CAUTION: ON GROUND, DO NOT RELY ON VISUAL ICING EVIDENCE OR ICE DETECTOR ACTUATION TO TURN ON THE ANTI-ICING SYSTEM. USE THE TEMPERATURE AND VISUAL MOISTURE CRITERIA AS SPECIFIED ABOVE. DELAYING THE USE OF THE ANTI-ICING SYSTEM UNTIL ICE BUILD-UP IS VISIBLE FROM THE COCKPIT MAY RESULT IN ICE INGESTION AND POSSIBLE ENGINE DAMAGE OR FLAMEOUT.

WINDSHIELD WIPER OPERATION

Maximum Airspeed for Windshield Wiper Operation.... 253 KIAS

AUTOPILOT

- Minimum Engagement Height .... 400 ft
- Minimum Use Height .... 50 ft

NAVIGATION/COMMUNICATION EQUIPMENT

- TAS, TAT and SAT information are only valid above 60 KIAS.
- While transmitting in VHF1 the standby magnetic compass indication is not valid.
- Baro altimeter minimums must be used for all Cat I approaches.
- Back course approaches using IESS is prohibited.
- The ACARS is limited to the transmission and receipt of messages that will not create an unsafe condition if the message is improperly received, unless they are verified per approved operational procedures.
- For airplanes Post-Mod. SB 170-34-0035 (ADS-B Out) or equipped with an equivalent modification factory incorporated, the ADS-B Out system complies with AMC 20-24 and was implemented according to DO-260A, change 1 and change 2.
- For airplanes Post-Mod SB 170-34-0034 (ADS-B Out) or equipped with an equivalent modification factory incorporated, the installed ADS-B Out system has been shown to meet the equipment requirements of 14 CFR § 91.227.

INERTIAL REFERENCE SYSTEM

- The airplanes may be operated within the North and South magnetic polar cut-out regions specified in the table below, but IRS magnetic heading and track angle magnetic data will not be available.

MAGNETIC CUT-OUT REGIONS	LATITUDE	LONGITUDE
North	Between 73.125°N and 82°N	Between 80°W and 130°W
	North of 82°N	Between 0° and 180°W/E

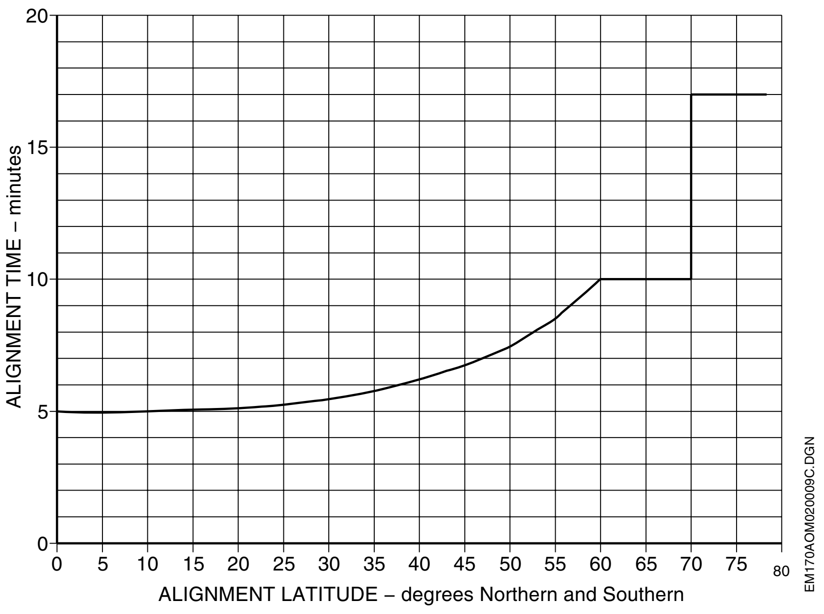
(Continued on the next page)

(Continued from the previous page)

MAGNETIC CUT-OUT REGIONS	LATITUDE	LONGITUDE
South	Between 60°S and 82°S	Between 120°E and 160°E
	South of 82°S	Between 0° and 180°W/E

NOTE: Whenever operating within North or South magnetic polar cut-out regions, current airplane heading must be referenced to true heading, if not already selected. Otherwise, the Heading Failure Indication flag will be displayed.

- Maximum latitude for stationary alignment:.............. 78.25° Northern and Southern
- IRS stationary alignment will complete only after a valid airplane present position (latitude and longitude) is received either from the FMS (pilot entry) or automatically from GPS.
- Time to stationary alignment completion:



AFM-1385

OZONE CONCENTRATION

The tables below show the airplane altitude limitations due to ozone concentration in atmosphere for airplanes not equipped with the Ozone Converters.

NOTE:
- These tables are based on FAA ADVISORY CIRCULAR 120.38.
- The tables show altitude limitations calculated for constant ozone concentration and cabin stabilized at 8000 ft.
- For conditions other than those specified in item 2 above, an optimized flight plan must be approved by regulatory agencies.
- For longitudes, the following apply:

  W = Western

  E = Eastern

  Reference = 100°W longitude

NORTH AMERICA - MAXIMUM OZONE CRITERIA

FLIGHT LEVEL	JAN		FEB		MAR		APR		MAY		JUN	
LATITUDE	W	E	W	E	W	E	W	E	W	E	W	E
80°N	-	323	-	323	-	314	-	313	-	307	-	326
75°N	-	327	-	323	-	321	-	314	-	314	-	327
70°N	-	341	-	323	-	326	-	321	-	314	-	334
65°N	356	346	333	326	328	327	328	321	326	321	338	336
60°N	376	356	347	336	338	334	327	326	327	326	341	336
55°N	394	362	376	346	347	341	327	334	327	327	347	356
50°N	407	376	409	362	366	346	327	336	334	336	356	366
45°N	-	396	-	376	376	366	346	346	346	362	376	396
40°N	406	-	366	386	376	396	382	366	402	396	-	-
35°N	-	-	-	-	-	-	-	-	-	-	-	-

FLIGHT LEVEL	JUL		AUG		SEP		OCT		NOV		DEC	
LATITUDE	W	E	W	E	W	E	W	E	W	E	W	E
80°N	-	336	-	382	-	394	-	382	-	346	-	346
75°N	-	346	-	396	-	386	-	382	-	362	-	356
70°N	-	346	-	406	-	396	-	382	-	382	-	356
65°N	346	356	396	406	406	406	382	394	406	386	376	366
60°N	347	366	402	-	-	-	396	401	407	394	386	382
55°N	356	382	406	-	-	-	-	-	407	401	401	396
50°N	366	406	-	-	-	-	-	-	-	406	-	-
45°N	-	-	-	-	-	-	-	-	-	-	-	-
40°N	-	-	-	-	-	-	-	-	-	-	-	-
35°N	-	-	-	-	-	-	-	-	-	-	-	-

NORTH AMERICA - TWA OZONE CRITERIA

NOTE: Values below are the altitude limitations which the airplane is allowed to fly more than 3 continuous hours.

FLIGHT LEVEL	JAN		FEB		MAR		APR		MAY		JUN	
LATITUDE	W	E	W	E	W	E	W	E	W	E	W	E
80°N	-	274	-	270	-	270	-	270	-	270	-	270
75°N	-	278	-	274	-	270	-	270	-	270	-	270
70°N	-	292	-	274	-	270	-	270	-	270	-	274
65°N	312	294	298	270	301	273	292	270	270	270	303	274
60°N	321	298	311	278	303	291	274	270	270	270	311	274
55°N	332	298	321	292	311	291	270	274	270	270	311	292
50°N	338	312	354	298	315	298	270	274	274	274	311	312
45°N	338	314	338	312	315	311	274	294	294	294	318	318
40°N	332	334	312	318	312	317	312	311	318	318	334	334
35°N	374	354	374	354	338	353	354	334	374	334	392	374

FLIGHT LEVEL	JUL		AUG		SEP		OCT		NOV		DEC	
LATITUDE	W	E	W	E	W	E	W	E	W	E	W	E
80°N	-	270	-	298	-	298	-	298	-	292	-	298
75°N	-	274	-	314	-	312	-	298	-	294	-	298
70°N	-	274	-	321	-	314	-	312	-	298	-	298
65°N	294	294	332	332	334	318	321	314	334	298	318	301
60°N	298	312	332	334	338	334	323	318	334	298	321	312
55°N	301	312	332	334	354	334	334	334	338	314	334	318
50°N	312	318	332	334	374	334	354	354	338	334	354	334
45°N	321	334	354	354	-	374	374	354	353	334	354	334
40°N	294	354	-	398	-	-	-	374	394	354	354	334
35°N	-	394	-	-	-	-	-	-	-	398	-	374

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 3

NORMAL PROCEDURES

TABLE OF CONTENTS

INTENTIONALLY BLANK

INTRODUCTION

The normal procedures contained in this manual have been developed and recommended by the manufacturer and approved by the certification authorities for use during the operation of the airplane.

Indented explanations (lines beginning further from the margin than the others) may follow a main item regarded as not being self-explanatory or lacking further details.

The actions identified with ϕ are recall items. They must be performed expeditiously and from memory.

INTENTIONALLY BLANK

INTERNAL SAFETY INSPECTION

Maintenance Status .... CHECK

Cockpit Emergency Equipment .... CHECK

GPU Button... PUSHED OUT

APU Generator Button.. PUSH IN

Fuel Panel.. CHECK

No Smoke Sign (If Installed).................................... AS REQUIRED

For airplanes without ashtrays on the passenger seats, the No Smoke sign must be set at ON during all flight phases.

Windshield Wiper.. OFF

Hydraulic Panel.. CHECK

Verify:

- SYSTEM 1 and 2 Electrical Pumps ..... AUTO
- SYSTEM 3 Electrical Pump A .... OFF
- SYSTEM 3 Electrical Pump B .... AUTO
- PTU .... AUTO

Landing Gear Lever .... DOWN

Start/Stop Selectors.. STOP

Slat/Flap Lever... VERIFY POSITION

Circuit Breakers .... CHECK

Photoluminescent Escape Path
Marking System (Passenger Cabin)................... CHARGED

INTENTIONALLY BLANK

POWER UP

Battery 1.. ON

Battery 2.. AUTO

<u>CAUTION</u>: VERIFY THAT ONLY DISPLAYS 2 AND 3 ARE AVAILABLE. IF MORE THAN DISPLAYS 2 AND 3 ARE AVAILABLE, THE AIRPLANE MUST NOT BE DISPATCHED.

Batteries Voltage.. CHECK

<u>CAUTION:</u> EACH BATTERY VOLTAGE MUST BE AT LEAST 22 VOLTS.

GPU Button.. AS REQUIRED

Emergency Lights Selector Knob............................. ON

- Verify the EMER LT ON and EMER LT NOT ARMED messages displayed on the EICAS.

Emergency Lights Selector Knob............................. ARMED

Fire Extinguisher Panel... CHECK

APU Selector Knob .... AS REQUIRED

MCDU Electronic CBs .... CHECK

DVDR Panel... CHECK

INTENTIONALLY BLANK

EXTERNAL INSPECTION

Prior to start the external inspection, apply the Emergency/Parking Brake.

Access Doors and Panels .... SECURED

Air Inlets, Outlets and Vents .... NO OBSTRUCTION

Antennas.. CONDITION

APU... CONDITION

Doors (Passenger, Service and Cargo) .... CHECK

Drain Masts... CONDITION

Engines and Pylons .... CONDITION

External Power Receptacles .... CHECK

Flight Controls Surfaces and Fairings .... CONDITON

Landing Gears and Brakes..................................... CONDITION

Leading Edges (Wings, Empennages).................... CONDITION

Lights .... CONDITION
Turn the lights OFF immediately after checking them.

Locking Pins (Landing Gear and RAT).................... REMOVED

Magnetic Level Indicators.. PUSHED IN, NO LEAKS

Oxygen Discharge Indicator .... GREEN DISC

Pressure Relief Valves .... CHECK

Pressurization Static Port.. NO OBSTRUCTION

Radome.. CHECK

Smart Probes/TAT Sensors/Ice Detectors .... CHECK

Static Dischargers.. NUMBER AND CONDITION

Thrust Reverser Cowls .... FLUSHED WITH NACELLE

Wing Water Drain Valves.. NO LEAKS

Windshield Wipers .... CHECK

BEFORE START

Airplane Manuals & Documents .... ON BOARD

Jump Seat Oxy Masks & Regulators........................ CHECK

Electrical Panel .... SET

Cockpit Lights Panel .... AS REQUIRED

Push the annunciators test button and verify all associated lights.

Engine 1 Fire Handle .... STOWED

Fuel Panel... SET

Passenger Signs Panel.. SET

Fire Extinguisher Panel.. CHECK

APU Control Panel.. AS REQUIRED

External Lights Panel .... AS REQUIRED

Engine 2 Fire Handle .... STOWED

Hydraulic Panel... SET

Pressurization Panel .... SET

Ice Protection Panel .... SET

Air Conditioning/Pneumatic Panel .... SET

Passenger Oxygen Panel .... SET

Oxygen Masks & Regulators CHECK/100%

- Check masks for supply of oxygen and for microphone functionality.
- The MFD Status page must be checked and the available oxygen supply and pressure must be adequate for use.

Glareshield Lights Control Panel .... AS REQUIRED

Display Control Panel .... SET

Speed Selector Knob .... MAN

Reversionary Panel .... SET

Flight Instruments .... SET/XCHECKED

Status Page .... CHECK

Verify Oil quantity and Hydraulic Brake Accumulator.

Gnd Prox Terr Inhib Button .... CHECK

EICAS .... CHECK

Clock .... SET

ELT .... ARMED

Gnd Prox G/S Inhib Button .... CHECK

LG Wrn Inhib Button .... CHECK

Flight Control Panel .... CHECK

Shaker 1 and 2 Cutout Buttons................................ CHECK

Verify the shaker 1 and 2 cutout buttons pushed out and no striped white bar illuminated.

Ignition Selectors .... AUTO

EICAS Full .... CHECK

Speedbrake Lever .... CLOSED

Thrust Levers... IDLE

Gnd Prox Flap Ovrd.. CHECK

Audio Control Panel .... AS REQUIRED

Trims... CHECK/SET

Flight Controls Disconnect Handles......................... CHECK

Alternate Gear
Extension Compartment.. CHECK

MCDU .... SET

Insert route in the FMS according to the flight plan.

-------------------------SHORTLY BEFORE STARTUP-------------------------

Fuel Quantity .... CHECK

MCDU .... SET

- Select the TAKEOFF DATA SET MENU page on the MCDU. Check if the performance data is consistent with the airplane configuration and set the data below:
  - Thrust Rate Mode (TO-1, TO-2 or TO-3).
  - Takeoff Temperature (__ºC).
  - ATTCS (ON or OFF).
  - REF ECS (ON or OFF).
  - REF A/I (OFF, ENG or ALL).
  - FLEX T/O (ON or OFF).
  - FLEX TEMP (__ºC).
- Select the TAKEOFF page on the MCDU. Set or verify airplane configuration, performance data and takeoff speeds.
- Select the LANDING page on the MCDU and set the landing speeds for the takeoff weight.

Speed Selector Knob .... SET

TOGA Button .... PRESS

Doors and Windows .... CLOSED

Pitch Trim .... SET

Takeoff Briefing .... COMPLETED

Red Beacon .... ON

Hydraulic Pump Sys 3A... ON

Ground Equipment .... AS REQUIRED

Steering Disengage Switch .... PRESS

ENGINE START

Associated Start Stop Selector .... START, then RUN

Engine Parameters .... MONITOR

Repeat the sequence for the other engine.

ABNORMAL ENGINE START INDICATIONS

Although FADEC provides automatic overtemperature protection and will automatically abort the start in the event of a hot start, hot restart or hung start, the engine start must be manually aborted when:

- No positive oil pressure indication within 10 seconds after N2 speed starts to increase.
- No ITT indication within 30 seconds after fuel is applied.
- ITT exceeds start limit (hot start).
- If oil pressure stabilizes below the engine limits.
- N_1 and/or N_2 failing to accelerate to stable idle speed (hung start).
- An intermittent electrical pneumatic or starter malfunction occurs before the starter disengagement.

NOTE: - In case an automatic abort occurs or engine start is manually aborted due to abnormal engine indications, its cause must be investigated and corrected before further attempts to start.

- For airplanes Post-Mod. SB 170-73-0007 or equipped with Engine FADEC 5.60 or later versions, two additional engine starts are allowed in case of automatic abort due to engine hot start.

INTENTIONALLY BLANK

AFTER START

APU.. AS REQUIRED

Ground Equipment.. REMOVED

Autobrake (if applicable) .... RTO

N1 Target... CHECK

Slat/Flap.. SET

Flight Controls.. CHECK

NOTE: The flight controls check must be performed with the flight controls synoptic page displayed.

INTENTIONALLY BLANK

BEFORE TAKEOFF

Take Off Configuration .... CHECK

Brake Temperature... CHECK

NOTE: Brake temperature indication must be in the green range for takeoff.

EICAS .... CHECK

Check:

- No Warning and Caution EICAS messages displayed.
- Thrust Rate Mode (TO-1, TO-2 or TO-3).
- ATTCS (if selected).
- FLEX TEMP (__ºC).

-------------------------SHORTLY BEFORE TAKEOFF------------------------

Cabin Crew .... ADVISE

Transponder .... TA/RA

Lights .... ON

INTENTIONALLY BLANK

TAKEOFF

Thrust Levers.. TOGA

Engine Parameters.. MONITOR

NOTE: During takeoff roll, after checking thrust levers to TOGA, check N1 equal to N1 target and green ATTCS indication presented on EICAS if ATTCS ON is selected in MCDU.

At V_R rotate the airplane following the flight director pitch angle.

In case of flight director is inoperative, rotate the airplane according to following schedule:

- For airplanes Pre-Mod. SB 170-31-0019:

FLAPS POSITION	1	2	4
PITCH ANGLE	11°	10°	12°

- For airplanes Post-Mod. SB 170-31-0019 or equipped with an equivalent modification factory incorporated, rotate the airplane according to the takeoff pitch angle displayed on TAKEOFF page 3/3 on the MCDU.

With positive rate of climb:

Landing Gear... UP

Minimum Airspeed.. V_2 + 10

INTENTIONALLY BLANK

AFTER TAKEOFF

Air Conditioning & Press .... CHECK

APU.. AS REQUIRED

Slat/Flap.. UP

Select Slat/Flap to up following the flap retraction speed reference indication.

Altimeters.. SET & XCHECK

-----------------------------AFTER 10000 FT AFE-------------------------------

External Lights .... OFF

No Smoking .... AS REQUIRED

Fasten Belts .... AS REQUIRED

INTENTIONALLY BLANK

DESCENT

Approach Briefing .... COMPLETE

Landing Data.. SET

Select the LANDING page on the MCDU and set V_{REF}, V_{AP}, V_{AC}, and V_{FS}.

INTENTIONALLY BLANK

APPROACH

Passenger Signs Panel.. SET

Altimeters.. SET & X-CHECK

Autobrake (if applicable)... AS REQUIRED

Approach Aids... SET & X-CHECK

INTENTIONALLY BLANK

BEFORE LANDING

Landing Gear .... DOWN

Slat/Flap... SET_

Lights .... AS REQUIRED

THIS PAGE INTENTIONALLY LEFT BLANK

GO AROUND

Go Around button.. PRESS

Thrust Levers... TOGA

Rotate or verify that autopilot rotates the airplane following the flight director guidance.

NOTE: In case of flight director is inoperative, rotate the airplane to 8º nose up.

Select flaps according to the table below:

Landing Slat/Flap	Go Around Slat/Flap
FULL	4
5	2

With positive climb:

Landing Gear .... UP
Minimum Airspeed.. V_{REF} + 20

At the acceleration altitude proceed as in a normal takeoff.

THIS PAGE INTENTIONALLY LEFT BLANK

AFTER LANDING

NOTE: Upon landing, thrust reversers should be set to MIN REV at 60 KIAS and be closed at 30 KIAS. During RTO the thrust reversers can be used until the airplane comes to a complete stop.

Slat/Flap.. 0

APU... AS REQUIRED

External Lights .... AS REQUIRED

Transponder .... STANDBY

THIS PAGE INTENTIONALLY LEFT BLANK

SHUTDOWN

Thrust Levers.. IDLE

Emergency/Parking Brake...................................... SET

Electrical .... ON GPU/APU

Start/Stop Selectors... STOP

Electric Hydraulic Pump 3A..................................... OFF

Red Beacon .... OFF

Fasten Belts.. OFF

INTENTIONALLY BLANK

LEAVING THE AIRPLANE

Passenger Signs Panel .... OFF

Set the Emergency Lights and all switches to OFF.

APU... OFF

Turn the APU off selecting the APU selector to OFF and wait until the APU shuts down before turning off both batteries selectors.

Batteries 1 & 2 .... OFF

THIS PAGE INTENTIONALLY LEFT BLANK

BUFFET ONSET ENVELOPE

The Buffet Onset data are provided by the CAFM presented in the Supplement 1.

THIS PAGE INTENTIONALLY LEFT BLANK

ENHANCED/GROUND PROXIMITY WARNING

When an EGPWS alert occurs, use the flight controls and thrust as necessary to correct the airplane attitude, flight path and configuration, according to the voice message presented, to provide terrain clearance.

WARNING: IF A TERRAIN AWARENESS WARNING OCCURS, IMMEDIATELY INITIATE AND CONTINUE A CLIMB THAT WILL PROVIDE MAXIMUM TERRAIN CLEARANCE UNTIL ALL ALERTS CEASE. ONLY VERTICAL MANOEUVRES ARE RECOMMENDED, UNLESS OPERATING IN VISUAL METEOROLOGICAL CONDITIONS (VMC), AND/OR THE PILOT DETERMINES, BASED ON AVAILABLE INFORMATION, THAT TURNING IN ADDITION TO THE VERTICAL ESCAPE MANOEUVRE IS A SAFER COURSE OF ACTION.

CAUTION:
- FOR EGPWS, THE TERRAIN DISPLAY IS INTENDED TO BE USED AS A SITUATIONAL AWARENESS TOOL ONLY AND MAY NOT PROVIDE THE ACCURACY AND/OR FIDELITY ON WHICH TO SOLELY BASE TERRAIN AVOIDANCE MANEUVERING DECISIONS.
- WHEN A TERRAIN AWARENESS CAUTION OCCURS, VERIFY THE AEROPLANE FLIGHT PATH AND CORRECT IT IF REQUIRED. IF IN DOUBT, PERFORM A CLIMB UNTIL THE CAUTION ALERT CEASES.

NOTE: Nuisance “LANDING GEAR” aural alerts may occur during TERRAIN events. The EGPWS aural alerts "TERRAIN, TERRAIN" and "OBSTACLE, OBSTACLE" would be delayed or suppressed in case the "LANDING GEAR" aural alert is active and the aural alert "PULL UP, PULL UP…" would be heard after the landing gear aural alert.

THIS PAGE INTENTIONALLY LEFT BLANK

WINDSHEAR PREVENTION/RECOVERY

ϕThrust Levers .... MAX
ϕGo Around Button .... PRESS

Rotate the airplane smoothly following the Flight Director on EADI to minimize altitude loss. Pitch attitude may be well above normal angles.

Maintain airplane configuration. Do not change gear and flap position until terrain clearance is assured.

THIS PAGE INTENTIONALLY LEFT BLANK

TRAFFIC AND COLLISION AVOIDANCE

The pilot must not initiate evasive maneuvers using Traffic Advisory information (TA) only, without visually sighting conflicting traffic.

The traffic display and advisories are intended for assistance in visually locating the indicated conflicting traffic.

Compliance with TCAS resolution advisory is required unless the pilot considers it unsafe to do so. Maneuvers that are in the opposite direction of the RA are extremely hazardous, especially RAs involving altitude crossing, and thus are prohibited unless it is visually determined to be the only means to assure safe separation.

WARNING: IT IS POSSIBLE IN SOME CASES TO HAVE INSUFFICIENT AIRPLANE PERFORMANCE TO FOLLOW THE TCAS COMMAND WITHOUT FLYING INTO STALL WARNING OR BUFFET. CONDITIONS WHERE THIS MAY OCCUR INCLUDE:

- **BANK ANGLE IN EXCESS OF 15 DEGREES.**
- **OPERATIONS AT AIRPORTS ABOVE 5300 FT MSL OR TEMPERATURES GREATER THAN ISA + 28°C (50°F).**
- **ENGINE INOPERATIVE.**
- **FAILURE TO CONFIGURE THE ARPLANE TO GO-AROUND FOLLOWING A CLIMB RA IN LANDING CONFIGURATION.**
- **FAILURE TO ADVANCE THRUST TO MAX CONTINUOUS THRUST FOLLOWING A CLIMB RA AT REDUCED THRUST.**
- **SPEEDS LESS THAN NORMAL OPERATING SPEED.**
- **ABNORMAL CONFIGURATIONS WHICH REDUCE PERFORMANCE (E.G. GEAR DOWN).**
- **TCAS COMMAND REVERSAL TO A "CLIMB-CLIMB NOW".**
- **BUFFET MARGIN LESS THAN 0.3G.**

WARNING: **IF STALL WARNING OCCURS DURING AN RA MANEUVER, IMMEDIATELY ABANDON THE RA AND EXECUTE STALL RECOVERY PROCEDURES. TCAS II WILL CONTINUE TO PROVIDE RAS DURING STALL WARNING AND RECOVERY PROCEDURE.**

WARNING: **IF HIGH SPEED BUFFET IS ENCOUNTERED WHEN INITIALLY RESPONDING TO AN RA, RELAX PITCH FORCE AS NECESSARY TO REDUCE BUFFET, BUT STILL CONTINUE TO MANEUVER.**

NOTE:
- The consequences of not following an RA may result in additional RA's in which aural alert and visual annunciations may not agree with each other.
- Using every available means, clear the airspace into which you are going to maneuver. If needed, promptly and smoothly adjust the airplane's pitch to fly into the green rectangle (if displayed), and fly out of the red trapezoidal shaped avoidance zone(s). This should require no more than 0.75g to 1.25g maneuver (+-0.25g).
- Exaggerated responses to TCAS RAs are not desirable or appropriate because of the other potential traffic conflicts and ATC consequences. From level flight, proper response to a TCAS RA typically results in an overall altitude deviation of 300 to 500 ft to resolve a traffic conflict.
- If a CLIMB RA is issued with the airplane in the landing configuration, a normal go-around should be initiated including the appropriate thrust increase and configuration change.
- Compliance with TCAS resolution advisories is required unless the pilot considers it unsafe to do so.
- The pilot should promptly return to the previous ATC clearance after the TCAS voice message "Clear of Conflict" is announced.
- An immediate smooth response to a RA is required to obtain maximum separations. TCAS II algorithms are based on the pilot initiating the initial maneuver within 5 seconds of the RA and within 2 1/2 seconds for additional corrective RA's (increases or reversals). Any delay in responding to RA's will reduce the separations provided.

TRANSPONDER

In compliance with Airworthiness Directive 2006-19-04, during all flight phases, after completion of any 4096 ATC Code change (also referred to as Mode A Code), check the status of the transponder. If the transponder indicates that it is in the standby mode, re-select the desired mode (i.e., the transponder should be in the active mode).

INTENTIONALLY BLANK

SIMOPERATION IN ICING CONDITIONS

The procedures below complement or change the remaining procedures presented in this Section. For emergency and abnormal procedures related to operation in icing conditions, refer to Section 4.

NOTE: - Icing conditions may exist whenever the Outside Air Temperature (OAT) on ground or for takeoff, or Total Air Temperature (TAT) inflight, is 10°C or less and visible moisture in any form is present (such as clouds, fog with visibility of one mile or less, rain, snow, sleet, and ice crystals).

- Icing conditions may also exist when OAT on ground or for takeoff is 10°C or less when operating on ramps, taxiways, or runways where surface snow, ice, standing water, or slush may be ingested by the engines, or freeze on engines, nacelles, or engine sensor probes.

CAUTION: EVEN SMALL ACCUMULATIONS OF ICE ON THE WING LEADING EDGE MAY CHANGE THE STALL CHARACTERISTICS OR THE STALL PROTECTION SYSTEM WARNING MARGIN.

BEFORE START

TO DATASET MENU.. ENG or ALL, AS REQUIRED

NOTE: - The TO DATASET MENU on the MCDU must be set to ENG in the following cases when OAT is from 5–10°C and:

- if there is any possibility of encountering visible moisture up to 1700 ft AFE, or

- when operating on ramps, taxiways, or runways where surface snow, ice, standing water, or slush may be ingested by the engines, or freeze on engines, nacelles, or engine sensor probes.

NOTE: - The TO DATASET MENU on the MCDU must be set to ALL in the following cases when OAT is less than 5°C and:

- if there is any possibility of encountering visible moisture up to 1700 ft AFE, or
- when operating on ramps, taxiways, or runways where surface snow, ice, standing water, or slush may be ingested by the engines, or freeze on engines, nacelles, or engine sensor probes.

HOLDING

Landing Gear .... UP
Flaps .... UP
Minimum Airspeed .... 210 KIAS

TURBULENT AIR PENETRATION

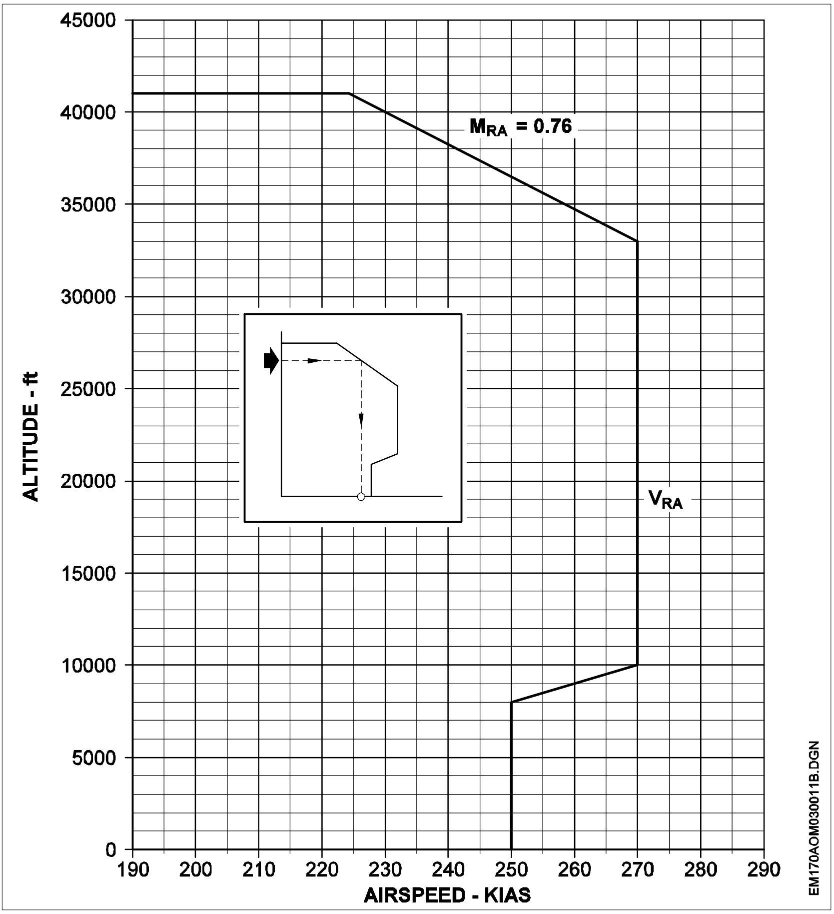
Adjust airspeed and disconnect the autothrottle. Set thrust for penetration and avoid large thrust variations. Set trim for target speed and do not change it.

Use attitude indicator as the primary instrument. Allow altitude and airspeed to vary and maintain attitude. Avoid abrupt and large control inputs.

NOTE: Do not extend flaps except for approach and landing.

The maximum recommended turbulence air penetration speed can be obtained from the following chart.

MAXIMUM RECOMMENDED TURBULENT AIR PENETRATION SPEED



SECTION 4

EMERGENCY AND ABNORMAL PROCEDURES

TABLE OF CONTENTS

INTRODUCTION

The emergency and abnormal procedures contained in this manual have been developed by the airplane manufacturer and approved by the Certification Authority for use in the operation of this airplane.

This section provides the emergency and abnormal procedures to be performed in case of a system malfunction or failure, in order to protect passengers and/or crew from serious harm and to maintain the airworthiness of the airplane.

The Emergency/Abnormal Procedures, in this section, are ordered in alphabetical sequence and divided into three blocks:

- Non-Annunciated Procedures: procedures, which are not related to an EICAS message but rather to a condition presented in the airplane.
- Annunciated Procedures: procedures related to an EICAS message. These procedures are grouped by system and titled with the correspondent EICAS message wording.
- Smoke Procedures: contain all annunciated and non-annunciated smoke related procedures.

The actions identified with ϕ are recall items. They must be performed expeditiously and from memory. The other actions should be performed as soon as the condition permits.

Some procedures require to LAND AT THE NEAREST SUITABLE AIRPORT. This statement may be presented below the associated emergency/abnormal characterization or at the beginning of a task that requires so. When the crew determines that significant threat to safety is present, they should always accomplish the earliest possible descent and land at the nearest suitable airport regardless of having this statement present in the procedure.

The procedures contained herein assume that:

- Airplane systems are operating normally prior to the failure.
- All emergency/abnormal checklists are performed in the order they are presented in the procedure.
- Normal procedures have been properly accomplished.
- System controls are in normal condition prior to initiation of the associated procedure.
- Aural warnings are silenced as applicable. Master Warning/ Caution lights are reset as soon as the failure is recognized.
- Circuit breakers must not be reset.

NON-ANNUNCIATED PROCEDURES

TABLE OF CONTENTS

Block Page

ABNORMAL PROCEDURES

CARGO COMPARTMENT FIRE

LAND AT THE NEAREST SUITABLE AIRPORT.

Push the associated cargo fire-extinguishing button.

After CRG AFT (FWD) FIREX HI ARM message is displayed and the associated cargo fire-extinguishing button is illuminated, push again the associated cargo fire-extinguishing button.

DITCHING

For descent, notify the cabin crew and ATC, set transponder to 7700, pull the aural warning CBs (C7 and C31) and set no smoking/fasten belts signs and ELT to on. Set the landing data.

At 10000 ft AGL, push the pressurization dump button. When the differential pressure is 0.2 psid or below, slow to below 160 KIAS and open the direct vision window. If required extend flap/slat as necessary to maintain the airspeed below 160 KIAS. Set pressurization mode to manual and hold the cabin alt controller down for 50 seconds.

For ditching configuration, set landing gear up, set slat/flap to the maximum available deflection and push the APU emergency stop button in.

Just before water contact, announce impact to the cabin.

After ditching, set thrust levers to idle, set the start/stop selectors to stop, pull fire-extinguishing handles, announce emergency evacuation and set batteries to off.

DUAL ENGINE FAILURE

ϕAirspeed .... 250 KIAS MIN
ϕRAT Manual Deploy Lever .... PULL

LAND AT THE NEAREST SUITABLE AIRPORT.

Start the APU, set the emergency lights to off and the thrust levers to idle.

If both engines were restarted via autorelight, reset (push in, then push out) the flight controls mode buttons (spoilers, elevators and rudder). For landing configuration, arm the emergency lights, push in the ground proximity flap override button, set slat/flap to 3 and set $V_{REF\ FULL}$ + 15 KIAS.

CAUTION: MULTIPLY THE FULL FLAPS UNFACTORED LANDING DISTANCE BY 1.31.

If one or no engine were restarted via auto relight, check the airstart envelope, set the fuel crossfeed selector knob to low 1 and, for the inoperative engine(s), set the start/stop selector(s) to stop, the ignition(s) to override and then, the start/stop selector(s) to start, then run.

If the dual engine failure condition persists, for landing configuration, arm the emergency lights, set slat/flap to 3 and set $V_{REF\ FULL}$ + 20 KIAS or 130 KIAS (whichever is higher) and accomplish the Forced Landing or Ditching Procedure.

If the dual engine failure condition does not persist, reset (push in, then push out) the flight controls mode buttons (spoilers, elevators and rudder) and, after the engine(s) stabilized at idle, set ignition(s) to auto and balance fuel. During descent, set the landing data, the approach aids and the altimeters. For landing configuration, arm the emergency lights, push in the ground proximity flap override button, set landing gear down, set slat/flap to 3 and set $V_{REF\ FULL}$ + 20 KIAS.

CAUTION: MULTIPLY THE FULL FLAPS UNFACTORED LANDING DISTANCE BY 2.10.

If a go around is required, maintain slat/flap to 3 and $V_{REF\ FULL}$ + 20 KIAS until the acceleration altitude is reached.

EMERGENCY DESCENT

ϕFasten Belts Signs .... ON
ϕAltitude .... 10000 ft or MEA WHICHEVER IS HIGHER
ϕThrust Levers .... IDLE
ϕSpeed Brake Lever .... FULL OPEN
ϕAirspeed .... MAX/ APPROPRIATE
ϕTransponder 7700
ϕATC .... NOTIFY

EMERGENCY EVACUATION

ϕEmergency/Parking Brake .... ON
ϕThrust Levers .... IDLE
ϕStart/Stop Selectors .... STOP
ϕFire Extinguishing Handles .... PULL and ROTATE (1-L and 2-R)
ϕAPU Emergency Stop Button .... PUSH IN
ϕAPU Fire Extinguishing Button .... PUSH
ϕPressurization Dump Button .... PUSH IN
ϕATC .... NOTIFY
ϕEmergency Evacuation .... ANNOUNCE
ϕBatteries .... OFF

ENGINE ABNORMAL START

ϕ Start/Stop Selector (affected engine) .... STOP

If an engine dry motoring is considered, set the affected engine ignition to off and the start/stop selector to start, then run. Wait 30 seconds and set the start/stop selector to stop and ignition to auto.

If applicable, accomplish the One Engine Inoperative Approach and Landing Procedure.

ENGINE FIRE, SEVERE DAMAGE OR SEPARATION

ϕAutothrottle .... DISENGAGE
ϕThrust Lever (affected engine) .... IDLE
ϕStart/Stop Selector (affected engine) .... STOP
ϕFire Extinguishing Handle (affected engine) .... PULL

LAND AT THE NEAREST SUITABLE AIRPORT.

Rotate the fire-extinguishing handle (to left or right).

If high vibration occurs, reduce the airspeed. If vibration persists, recommend reducing the airspeed below V_A.

If affected side Fuel Indication is lost, assume fuel is leaking from the affected side.

Use the APU, the autothrottle and fuel crossfeed as required.

When appropriate, accomplish the One Engine Inoperative Approach and Landing Procedure.

FORCED LANDING

For descent, notify the cabin crew and ATC, set transponder to 7700, pull the aural warning CBs (C7 and C31) and set no smoking/fasten belts signs and ELT to on and set the landing data.

At 10000 ft push the pressurization dump button in. During approach, set the altimeters.

For landing configuration, push the terrain inhibit button in, set landing gear lever to down, set slat/flap to the maximum available deflection and push in the APU emergency stop button.

NOTE: If engines are not running maintain minimum speed of 130 KIAS and alternate gear extension may be required.

Just before touchdown, announce impact to the cabin.

After landing, set thrust levers to idle, start/stop selectors to stop, pull and rotate the fire-extinguishing handles, announce emergency evacuation and set batteries to off.

FUEL LEAK

LAND AT THE NEAREST SUITABLE AIRPORT.

Set the fuel crossfeed selector to off and identify the affected fuel tank. Use asymmetric thrust to improve or maintain wing fuel balance to counteract the effect of the suspected wing fuel leak.

If fuel leak is identified on the right side tank, set APU to off.

If fuel leak is identified on the left side tank, use APU as required.

JAMMED CONTROL COLUMN (PITCH)

ϕElevator Disconnection Handle.................................. PULL

Identify the unrestricted control column.

If the failure occurs above 175 KIAS, the current airspeed is the maximum speed for the remainder of the flight.

If the failure occurs below 175 KIAS, the maximum speed for the remainder of the flight is 175 KIAS.

NOTE: Expect lower pitch rates and authority.

Accomplish the AOA Limit Failure Procedure.

For landing configuration set slat/flap to 5 and set $V_{REF\ FULL}$ + 15 KIAS.

CAUTION: MULTIPLY THE FULL FLAPS UNFACTORED LANDING DISTANCE BY 1.40.

If a go around is required, maintain $V_{REF\ FULL}$ + 15 KIAS (limited to 175 KIAS) until the acceleration altitude is reached.

JAMMED CONTROL WHEEL (ROLL)

ϕAileron Disconnection Handle .... PULL

Identify the unrestricted control column.

If the failure occurs above 175 KIAS, the current airspeed is the maximum speed for the remainder of the flight.

If the failure occurs below 175 KIAS, the maximum speed for the remainder of the flight is 175 KIAS.

NOTE: - Expect lower roll rates.
- Avoid abrupt and large aileron inputs.
- Maintain bank angle below 25°.
- Rudder may be used to help controlling the airplane.
- Do not accomplish the Spoiler Fault Procedure.

For landing configuration set slat/flap to 5 and set $V_{REF\ FULL}$ + 15 KIAS.

CAUTION:
- DURING LANDING, A CROSSWIND COMPONENT GREATER THAN 10 KT MUST BE AVOIDED.
- MULTIPLY THE FULL FLAPS UNFACTORED LANDING DISTANCE BY 1.40.

If a go around is required, maintain $V_{REF\ FULL}$ + 15 KIAS (limited to 175 KIAS) until the acceleration altitude is reached.

JAMMED RUDDER PEDALS

If the failure occurs above 175 KIAS, the current airspeed is the maximum speed for the remainder of the flight.

If the failure occurs below 175 KIAS, the maximum speed for the remainder of the flight is 175 KIAS.

NOTE: Use assymetric thrust for directional control. For landing configuration set slat/flap to full and set $V_{REF\ FULL}$.

CAUTION: DURING LANDING, A CROSSWIND COMPONENT GREATER THAN 10 KT MUST BE AVOIDED.

Before landing, the pilot not flying must press and hold the steering disconnect switch. Use assymetric thrust until nosewheel touchdown.

After nosewheel touchdown, press and hold the nosewheel steering handle, release the steering disconnect switch, reduce the thrust levers and use differential braking as required.

CAUTION: DO NOT RELEASE THE NOSEWHEEL STEERING HANDLE UNTIL THE AIRPLANE IS COMPLETELY STOPPED.

If a go around is required, proceed as a normal go around limiting the airspeed to 175 KIAS.

NOTE: As assymetric thrust may be required to help controlling the airplane, maximum thrust on both engines may not be possible.

PITCH TRIM RUNAWAY

ϕA/P Disc Button .... PRESS AND HOLD

ϕPitch Trim Systems 1 and 2
Cutout Button .... PUSH IN

Release the A/P Disc button.

WARNING: DO NOT OPEN THE SPEEDBRAKE.

Push the pitch trim system 1 cutout button out and actuate the pitch trim switch.

If pitch trim is normal, continue the flight using pitch trim system 1 only.

If pitch trim is abnormal, push pitch trim system 1 cutout button in and push pitch trim system 2 cutout button out. Continue the flight using pitch trim system 2 only.

REJECTED TAKEOFF

ϕThrust Levers .... IDLE
ϕReverse Thrust.. AS REQUIRED
ϕBrake Pedals (If Autobrake is not Armed).................. MAXIMUM APPLY

NOTE: During RTO the thrust reversers can be used until the airplane comes to a complete stop.

When airplane has stopped:

Emerg/Parking Brake .... ON

If applicable:

EMERGENCY EVACUATION Procedure................ ACCOMPLISH

ROLL (YAW) TRIM RUNAWAY

ϕA/P Disc Button.. PRESS AND HOLD

Do not engage the autopilot.

Prepare to overcome unexpected roll or yaw and release A/P disc button.

If the roll (yaw) trim does not return to normal, press and hold the A/P disc button, turn the roll (yaw) trim power electronic cb off (select on the MCDU: CB → CB MENU → CB BY SYSTEM → NEXT → FLT CTRL → ROLL TRIM PWR or YAW TRIM PWR) and release the A/P disc button.

STEERING RUNAWAY

ϕSteer Disc Switch.. PRESS

ϕSteer the airplane using differential braking and rudder.

TAKEOFF WITH ENGINE FAILURE AT OR ABOVE V_1

ϕAt V_R rotate the airplane following the flight director guidance.

ϕ In case of flight director is inoperative rotate the airplane according to the following schedule:

- For airplanes Pre-Mod. SB 170-31-0019:

FLAPS POSITION	1	2	4
PITCH ANGLE	11°	10°	12°

- For airplanes Post-Mod. SB 170-31-0019 or equipped with an equivalent modification factory incorporated, rotate the airplane according to the takeoff pitch angle displayed on TAKEOFF page 3/3 on the MCDU.

ϕWith positive climb:

ϕLanding Gear .... UP
ϕAirspeed .... MIN V_2

Maintain V_2 minimum up to the level off. At the level off, retract flaps according to the flap retraction speed reference indication.

Accelerate the airplane to the final segment speed (V_{FS}) and set the engine thrust to continuous.

After retracting flaps, accomplish the Engine 1 (2) Failure Procedure.

ABNORMAL LANDING GEAR EXTENSION

Move landing gear lever to down and select the electrical override switch to gear down.
If landing gear indications are not confirmed down, pull the alternate gear extension lever. Check landing gear indications. If landing gear indications are still not confirmed down, accomplish the Partial or Gear Up Landing Procedure.

APU EGT AMBER INDICATION

Shut the APU down if it is not essential for the flight.

BLANK DISPLAY UNIT WITHOUT AUTOMATIC REVERSION

Select the affected side reversionary panel display selector to PFD or EICAS, as required.

ENGINE ABNORMAL VIBRATION

The engine vibration indication on EICAS displayed in amber.

Disengage the autothrottle.

If engine vibration is due to ice accumulation, reduce the associated thrust lever to idle and then advance to 70% N1 minimum. Wait 30 seconds and operate the thrust lever as required.

If engine vibration is not due to ice accumulation, reduce N1 to achieve green range vibration, then advance to desired N1.

> If vibration does not return to normal range, reduce the associated thrust lever in order to keep vibration within normal range.
>
> If unable to keep vibration within limits and engine parameters become abnormal or exceed operating limits, consider an engine shutdown.

ENGINE AIRSTART

NOTE: Starts are more reliable with ITT lower than 90°C.

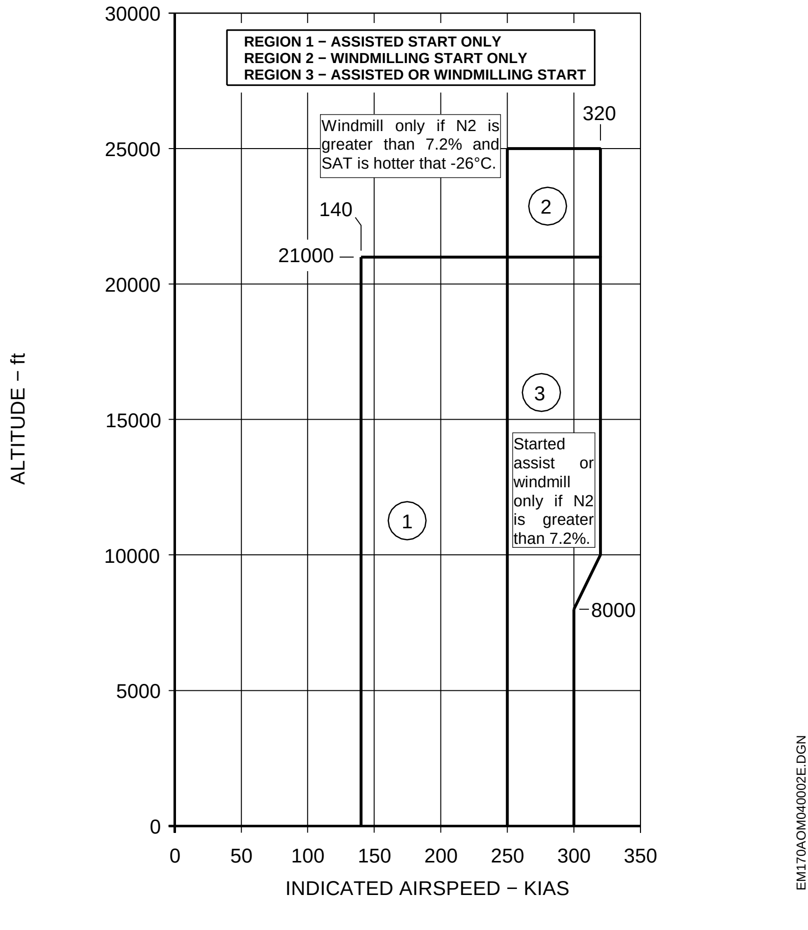
Disengage the autothrottle and check the airstart envelope.

If N2 has gone to 0, more than one start attempt may be required to get a successful engine start.

If an engine assisted airstart is considered, set the operative engine N2 to 80% minimum, set the inoperative engine ignition to override and the start/stop selector to start, then run. If the engine was restarted, set the ignition to auto after engine stabilizes at idle. If the engine was not restarted, set its start/stop selector to stop, the ignition to auto, balance the fuel and accomplish the One Engine Inoperative Approach and Landing Procedure.

If an engine windmilling airstart is considered turn the crossbleed off. If engine 1 is the inoperative engine, turn the APU bleed off. For the inoperative engine, set N2 to 7.2% minimum, ignition to override and the start/stop selector knob to start, then run. If the engine was restarted, set the ignition to auto and push the crossbleed button in, after engine stabilizes at idle. If the engine was not restarted, push the crossbleed button in, set its start/stop selector knob to stop, set its ignition to auto, balance the fuel and accomplish the One Engine Inoperative Approach and Landing Procedure.

ENGINE AIRSTART ENVELOPE



ENGINE ITT OVERTEMPERATURE

The ITT pointer and digits will be flashing in red.

Disengage the autothrottle and reduce the affected engine thrust lever in order to keep ITT within limits.

ENGINE SHUTDOWN

LAND AT THE NEAREST SUITABLE AIRPORT.

Disengage the autothrottle.

For the affected engine, reduce the thrust lever to idle and the start/stop selector to stop. Start the APU, verify associated fuel pump in AUTO and balance the fuel.

When appropriate, accomplish the One Engine Inoperative Approach and Landing Procedure.

GEAR LEVER CAN NOT BE MOVED UP

If LG WOW SYS FAIL EICAS message is displayed, maintain landing gear lever at down position and accomplish the Landing Gear Weight-On-Wheels System Failure Procedure. If a go around is required, maintain landing gear down.

NOTE: The downlock override button may be pressed to move the landing gear lever up if climb performance is required to clear obstacles.

If LG WOW SYS FAIL EICAS message is not displayed, press the downlock override button and move the landing gear lever up. If a go around is required, press the downlock override button and move the landing gear lever up.

IMPAIRED OR CRACKED WINDSHIELD

Turn off the affected windshield heating and close the cockpit door.

If only the outer layer is cracked, continue the flight.

NOTE: There is a windshield heating wire between the middle and outer layers that can be used as a reference to determine which layer is cracked. If the wire can be seen without a gap the crack is in the outer layer, and if there is a wire discontinuity, the crack may be located on the middle and/or inner layers.

(Continues on the next page)

(Continued from the previous page)

If the inner or/and middle layer is cracked, limit airspeed to 220 KIAS maximum and limit altitude to 10000 ft or MEA (whichever is higher). During descent, select pressurization to manual mode and increase cabin altitude. While descending, maintain cabin altitude at 10000 ft. At or below 10000 ft, turn both packs off and check forward visibility. If only one side is not impaired, the pilot flying must be on the non-impaired side. If both sides are impaired, limit airspeed to 140 KIAS maximum and open the direct vision window.

CAUTION: ACCOMPLISH THE DESCENT IN A MAXIMUM OF 15 MINUTES.

LOSS OF AUXILIARY POWER UNIT INDICATIONS

If the APU RPM or APU EGT indication on EICAS is displayed in amber dashes and APU is not essential for the flight, press the APU emergency stop button, set the APU master selector to OFF and do not restart the APU.

If the APU RPM or APU EGT indication on EICAS is displayed in amber dashes and APU is essential for the flight, monitor APU fault messages. If any APU fault message is displayed on EICAS, press the APU emergency stop button, set the APU master selector to OFF and do not restart the APU.

LOSS OF HYDRAULIC SYSTEM 1

Disengage the autopilot.

NOTE:
- Expect lower roll rates and lower speedbrake efficiency.
- Do not accomplish the Spoiler Fault Procedure.
- Do not command engine 1 reverser.

Plan a long final approach.

For landing configuration, set slat/flap to full and set $V_{REF\ FULL}$.

CAUTION: MULTIPLY THE FULL FLAPS UNFACTORED LANDING DISTANCE BY 1.90.

LOSS OF HYDRAULIC SYSTEM 2

NOTE: - Expect lower roll rates and lower speedbrake efficiency.
- Do not accomplish the Spoiler Fault Procedure.
- Do not command engine 2 reverser.

Plan a long final approach.

For landing configuration, set the landing gear lever to down, pull the alternate gear extension lever, set slat/flap to full and set $V_{REF\ FULL}$.

CAUTION: MULTIPLY THE FULL FLAPS UNFACTORED LANDING DISTANCE BY 1.80.

If a go around is required, maintain landing gear down.

LOSS OF HYDRAULIC SYSTEM 1 AND 2

LAND AT THE NEAREST SUITABLE AIRPORT.

NOTE: - Expect lower roll and pitch rates.
- Do not accomplish the Elevator Fault and the Spoiler Fault Procedures.
- Apply the Emergency/Parking Brake to stop the airplane monitoring the Emergency/Parking Brake light.
- Braking action starts after Emerg/Prkg Brake light illumination. Apply the brake carefully since antiskid protection is not available.

Plan a long final approach.

For landing configuration set landing gear down, pull the alternate gear extension lever, set slat/flap to 5 and set $V_{REF\ FULL}$ + 10 KIAS.

CAUTION:
- MULTIPLY THE FULL FLAPS UNFACTORED LANDING DISTANCE BY 2.70.
- AVOID LANDING WITH CROSSWIND COMPONENT GREATER THAN 10 KT.

If a go around is required, maintain landing gear down, set slat/flap to 4, and maintain $V_{REF\ FULL}$ + 10 KIAS until the acceleration altitude is reached.

LOSS OF HYDRAULIC SYSTEM 1 AND 3

LAND AT THE NEAREST SUITABLE AIRPORT.

NOTE: - Expect lower roll rates and lower speedbrake efficiency.
- Do not accomplish the Spoiler Fault Procedure.
- Do not command engine 1 reverser.

For landing configuration set slat/flap to 5 and set $V_{REF\ FULL}$ + 10 KIAS.

CAUTION: • AVOID LANDING WITH CROSSWIND COMPONENTS ABOVE 10 KT.

• MULTIPLY THE FULL FLAPS UNFACTORED LANDING DISTANCE BY 2.30.

LOSS OF HYDRAULIC SYSTEM 2 AND 3

LAND AT THE NEAREST SUITABLE AIRPORT.

NOTE: - Expect lower roll and pitch rates and lower speedbrake efficiency.
- Do not accomplish the Elevator Fault and the Spoiler Fault Procedures.
- Do not command engine 2 reverser.

Plan a long final approach.

For landing configuration, set landing gear down, pull the alternate gear extension lever, set slat/flap to 5 and set $V_{REF\ FULL}$ + 10 KIAS.

CAUTION: • AVOID LANDING WITH CROSSWIND COMPONENTS ABOVE 10 KT.

• MULTIPLY THE FULL FLAPS UNFACTORED LANDING DISTANCE BY 2.20.

If a go around is required, maintain landing gear down, set slat/flap to 4, and maintain $V_{REF\ FULL}$ + 10 KIAS until the acceleration altitude is reached.

LOSS OF PRESSURIZATION INDICATION

Use the remaining indications to maintain cabin altitude below 10000 ft, according to the table below:

AIRPLANE ALTITUDE (ft)	CABIN ALTITUDE (ft)	DIFFERENTIAL PRESSURE (PSID)
10000	900	4.2
11000	1000	4.5
12000	1200	4.8
13000	1300	5.1
14000	1500	5.3
15000	1700	5.6
16000	1900	5.8
17000	2100	6.0
18000	2300	6.2
19000	2600	6.4
20000	2800	6.6
21000	3000	6.7
22000	3300	6.9
23000	3600	7.0
24000	3900	7.1
25000	4200	7.2
26000	4500	7.3
27000	4800	7.4
28000	5100	7.5
29000	5400	7.5
30000	5700	7.6
31000	6000	7.7
32000	6300	7.7
33000	6700	7.7
34000	7000	7.8
35000	7300	7.8
36000	7600	7.8
37000	8000	7.8
38000	8000	8.0
39000	8000	8.1
40000	8000	8.3
41000	8000	8.4

ONE ENGINE INOPERATIVE APPROACH AND LANDING

During descent, set landing data, approach aids and altimeters.

For landing configuration, set landing gear down, set slat/flap to 5 and set $V_{REF\ FULL}$ + 20 KIAS.

CAUTION: MULTIPLY THE FULL FLAPS UNFACTORED LANDING DISTANCE BY 1.40.

If a go around is required, press the go around button, advance thrust levers to TOGA position, rotate the airplane following the flight director guidance and set slat/flap to 2.

NOTE: In case of flight director guidance is inoperative, rotate the airplane to 8° nose up.

With positive climb, set landing gear up and set the airspeed to the approach climb speed.

OXYGEN LEAKAGE

Turn on no smoking signs, actuate the oxygen test/reset button and maintain altitude as required.

PARTIAL OR GEAR UP LANDING

Plan to land on available gear and burn off fuel to reduce touchdown speed.

Prior to approach, notify the cabin crew, pull the Aural Warning CB´s (C7; C31), turn the APU off, push the pressurization dump button in, set landing gear down and slat/flap to full position.

Just before touchdown, announce to the cabin.

After landing, set thrust levers to idle, set the start/stop selectors to stop, pull and rotate the fire extinguishing handles, announce emergency evacuation and set batteries to off.

If a go around is required, maintain landing gear down.

STRUCTURAL DAMAGE

LAND AT THE NEAREST SUITABLE AIRPORT.

Limit the airspeed to V_A maximum.

If the fuselage is damaged, limit altitude to 10000 ft or MEA (whichever is higher) and press the pressurization dump button in when reaching 10000 ft.

Establish landing configuration early.

AIRPLANE GENERAL (DOORS/LIGHTING/CARGO COMPARTMENT)

TABLE OF CONTENTS

INTENTIONALLY BLANK

DOOR CARGO FORWARD (AFT) OPEN

If pressurization is normal, continue the flight monitoring the pressurization.

If pressurization is abnormal, LAND AT THE NEAREST SUITABLE AIRPORT, limit the altitude to 10000 ft or MEA (whichever is higher). At 10000 ft, push the pressurization dump button in.

DOOR PASSENGER (SERVICE) FORWARD (AFT) OPEN

Turn the fasten seat belts signs on.

If pressurization is normal, check the door indicators on the affected door. If at least two door indicators are in green, continue the flight monitoring the pressurization. If less than two door indicators are in green, LAND AT THE NEAREST SUITABLE AIRPORT, limit the altitude to 10000 ft or MEA (whichever is higher). At 10000 ft, push the pressurization dump button in.

If pressurization is abnormal, LAND AT THE NEAREST SUITABLE AIRPORT, limit the altitude to 10000 ft or MEA (whichever is higher). At 10000 ft, push the pressurization dump button in.

DOOR FORWARD (CENTER) ELECTRONIC BAY OPEN

If pressurization is abnormal, limit the altitude to 10000 ft or MEA (whichever is higher).

DOOR HYDRAULIC OPEN

Limit the airspeed to 250 KIAS maximum.

EMERGENCY LIGHT NOT ARMED

Arm the emergency lights.

EMERGENCY LIGHT ON

Set the emergency lights to off and then to armed.

EMERGENCY LIGHT BATTERY FAULT

Do not takeoff.

INTENTIONALLY BLANK

AMS (PNEUMATICS, AIR CONDITIONING/PRESSURIZATION)

TABLE OF CONTENTS

INTENTIONALLY BLANK

CABIN ALTITUDE HIGH

ϕCrew Oxygen Masks	DON, 100%
ϕCrew Communication	ESTABLISH
ϕAltitude	10000 ft or MEA, WHICHEVER IS HIGHER
ϕThrust Levers	IDLE
ϕSpeed Brake	FULL OPEN
ϕAirspeed	MAX/ APPROPRIATE
ϕTransponder	7700
ϕATC	NOTIFY

Monitor the cabin altitude.

If the cabin altitude reaches 14500 ft, set the passenger oxygen selector to OVRD.

At 10000 ft or MEA, press the pressurization dump button.

AMS CONTROLLER FAILURE

Exit and avoid icing conditions and limit the altitude to 10000 ft or MEA (whichever is higher) maximum. At 10000 ft, push the pressurization dump button in.

NOTE: - Assisted crossbleed start is not available.
- Pneumatic assisted engine start APU is not available.

BLEED APU LEAKAGE

Turn off APU bleed and wait 3 minutes.

If the message BLEED APU LEAK persists, press the APU emergency stop button to turn the APU off.

If the message BLEED APU LEAK still persists, turn bleed 1 and the crossbleed off and verify BLEED 1 OFF and XBLEED SW OFF messages are displayed on EICAS.

BLEED 1 (2) FAILURE

Turn off the affected bleed and wait 1 minute.

If the BLEED 1 (2) FAIL message extinguishes, turn the affected bleed on.

If the BLEED 1 (2) FAIL message persists, limit the altitude to 31000 ft maximum.

If both engine bleeds are inoperative and APU bleed is available, limit the altitude to 15000 ft maximum.

BLEED 1 (2) LEAKAGE

Push the affected bleed button and the crossbleed button out. For Bleed 1 Leak, push also the APU bleed out. Exit and avoid icing conditions. Limit the altitude to 31000 ft maximum and wait 3 minutes.

If the BLEED 1 (2) LEAK message persists, push the opposite side bleed button out, the APU bleed button out and limit the altitude to 10000 ft or MEA (whichever is higher). At 10000 ft push the pressurization dump button in.

BLEED 1 (2) OVERPRESSURE

Push the affected bleed button out then in.

If the Bleed 1 (2) OVERPRESSURE message persists push the affected bleed and the crossbleed button out. For Bleed 1 Overpress, push also the APU bleed button out. Exit and avoid icing conditions. Limit the altitude to 31000 ft maximum.

If the BLEED 1 (2) OVERPRESSURE message persists, reduce the associated thrust levers to idle and, when applicable, accomplish the One Engine Inoperative Approach and Landing Procedure.

CABIN DIFFERENTIAL PRESSURE FAILURE

If the cabin differential pressure reached the red limit, check its indication. If the indication is positive, turn off both packs and limit the altitude to 10000 ft or MEA (whichever is higher) maximum. If the indication is negative, reduce the airplane descent rate.

CARGO FORWARD VENTILATION FAILURE

LAND AT THE NEAREST SUITABLE AIRPORT.

CENTER ELECTRONIC BAY FANS FAILURE

LAND AT THE NEAREST SUITABLE AIRPORT.

FORWARD ELECTRONIC BAY FANS FAILURE

If the TRU 1 (2) FAIL is displayed, LAND AT THE NEAREST SUITABLE AIRPORT.

PACK 1 (2) FAILURE

Set the associated cabin temperature controllers to 12 o'clock position and turn the affected pack off. Wait 1 minute and turn the affected pack on.

If the PACK 1 (2) FAIL message extinguishes, wait 1 minute and operate the associated temperature controller normally.

If the PACK 1 (2) FAIL message persists, turn the affected pack off and limit the altitude to 31000 ft maximum.

PACK 2 LEAKAGE

Turn pack 2 off and limit the altitude to 31000 ft maximum. Wait 3 minutes.

If the PACK 2 LEAK message persists, exit and avoid icing conditions, turn bleed 2 off and the crossbleed off.

PRESSURIZATION AUTO FAILURE

Set the pressurization to manual, then to auto.

If the PRESN AUTO FAIL message persists, set the pressurization to manual and control the cabin altitude according to the loss of pressurization indication table (see non annunciated procedures block). When appropriate set cabin altitude selector knob to UP and hold it for 50 seconds.

PRESSURIZATION MANUAL FAILURE

Limit the altitude to 10000 ft or MEA (whichever is higher) maximum.

At 25000 ft, turn one pack off. At 10000 ft, turn the remaining pack off.

RECIRCULATION SMOKE DETECTION FAILURE

Turn off the recirculation fan.

BLEED 1 (2) OFF

Limit the altitude to 31000 ft maximum.

PACK 1 (2) OFF

Limit the altitude to 31000 ft maximum.

INTENTIONALLY BLANK

AUTOFLIGHT

TABLE OF CONTENTS

INTENTIONALLY BLANK

AUTOPILOT FAILURE

Fly the airplane manually.

The AP may be available for re-engagement 10 seconds after disengagement.

AUTOPILOT PITCH MISTRIM

Hold the control wheel firmly, disengage the autopilot and trim the airplane. The autopilot may be available for reengagement.

AUTOPILOT PITCH TRIM FAILURE

Hold the control wheel firmly, disengage the autopilot and trim the airplane.

AUTOPILOT ROLL MISTRIM

Trim the airplane using roll trim.

AUTOTHROTTLE FAILURE

Operate the thrust levers manually.

The AT may be available for re-engagement 10 seconds after disengagement.

AUTOTHROTTLE NOT IN HOLD

Disengage the autothrottle.

FLIGHT DIRECTOR LATERAL MODE OFF

Select a flight director lateral mode.

FLIGHT DIRECTOR VERTICAL MODE OFF

Select a flight director vertical mode.

SHAKER ANTICIPATED

Avoid side slipping the airplane. If speed is above Mach 0.5, limit airspeed to a minimum of 250 KIAS.

NOTE: Above Mach 0.5, stick shaker and Low Speed Awareness (LSA) are not available.

If the FLAP (SLAT) FAIL message is displayed, accomplish the FLAP (SLAT) FAIL Procedure.

If the FLAP (SLAT) FAIL message is not displayed, for landing configuration set slat/flap full, set $V_{REF\ FULL}$, and limit bank angle to 20° maximum.

STALL PROTECTION FAILURE

Avoid side slipping the airplane.

For landing configuration, set slat/flap to 5 or set slat/flap to full.

For landing with slat/flap 5, set $V_{REF\ FULL}$ + 15 KIAS.

CAUTION: MULTIPLY THE FULL FLAPS UNFACTORED LANDING DISTANCE BY 1.40.

For landing with slat/flap full, set $V_{REF\ FULL}$ + 10 KIAS.

CAUTION: MULTIPLY THE FULL FLAPS UNFACTORED LANDING DISTANCE BY 1.22.

AUTO FLIGHT CONTROL SYSTEM FAULT

Do not takeoff.

STALL PROTECTION FAULT

Do not takeoff.

INTENTIONALLY BLANK

AUXILIARY POWER UNIT

TABLE OF CONTENTS

INTENTIONALLY BLANK

APU ALTITUDE EXCEEDANCE

If APU is not essential for the flight, turn it off.

If APU is essential for the flight, descend to an altitude where the message is no longer displayed.

APU FAILURE

If the APU FAIL message was displayed during APU start, the APU can be restarted according to the starter limitations.

If the APU FAIL message was displayed during APU normal operation, turn off the APU and do not restart it.

APU FAULT

If APU is not essential for the flight, turn it off even if the indications on EICAS are normal.

If APU is essential for the flight and any APU indication is abnormal, turn the APU bleed off. If the abnormal indication remains, turn the APU off. If the abnormal indication does not remain, continue the flight.

APU OIL HIGH TEMPERATURE

Accomplish the APU Fault Procedure.

APU OIL LOW PRESSURE

Accomplish the APU Fault Procedure.

INTENTIONALLY BLANK

ELECTRICAL

TABLE OF CONTENTS

INTENTIONALLY BLANK

BATTERY DISCHARGING

LAND AT THE NEAREST SUITABLE AIRPORT.

BATTERY 1 (2) OVERTEMPERATURE

ϕAssociated Battery .... OFF

NOTE: Do not start the APU.

BATTERY 1-2 OFF

LAND AT THE NEAREST SUITABLE AIRPORT.

NOTE: APU start is not available.

ELECTRICAL EMERGENCY

LAND AT THE NEAREST SUITABLE AIRPORT.

Limit the airspeed to 150 KIAS minimum, start the APU, reset (set to off, then to auto) IDG 1 and IDG 2 and set the emergency lights to off.

CAUTION: ONLY TWO APU START ATTEMPTS ARE ALLOWED.

If ELEC EMERGENCY message extinguishes, reset (push in, then out) the flight controls mode buttons (spoilers, elevators and rudder). For landing configuration, arm the emergency lights, push in the ground proximity flap override button, set slat/flap to 3 and set $V_{REF\ FULL}$ + 15 KIAS.

CAUTION: MULTIPLY THE FULL FLAPS UNFACTORED LANDING DISTANCE BY 1.31.

If ELEC EMERGENCY message persists, exit and avoid icing conditions and limit the altitude to 10000 ft or MEA (whichever is higher) maximum. If BATT DISCHARGING message is presented, deploy the RAT manually and set TRU 1 and TRU 2 to off.

NOTE: - Avoid side slipping the airplane.
- On ground, use differential braking and rudder to steer the airplane.
- The slats and flaps will operate at low rate.

For landing configuration, arm the emergency lights, push in the ground proximity flap override button, set slat/flap to 3 and maintain $V_{REF\ FULL}$ + 20 KIAS or 130 KIAS (whichever is higher).

CAUTION: MULTIPLY THE FULL FLAPS UNFACTORED LANDING DISTANCE BY 2.10.

If a go around is required, maintain slat/flap 3 and $V_{REF\ FULL}$ + 20 KIAS or 130 KIAS (whichever is higher) until the acceleration altitude is reached.

AC BUS 1 OFF

NOTE: - The slats will operate at low rate.
- Fuel Crossfeed Low 2 is not available.

When flying in icing conditions, set the ice protection mode to on and return it to auto 2 minutes after exiting icing conditions.

AC BUS 2 OFF

NOTE: The flaps will operate at low rate.

When flying in icing conditions, set the ice protection mode to on and return it to auto 2 minutes after exiting icing conditions.

AC ESSENTIAL BUS OFF

NOTE: - The flaps and slats will operate at low rate.
- Fuel Crossfeed Low 1 is not available.

AC STANDBY BUS OFF

Monitor electrical system.

NOTE: Engine Start with batteries only is not available.

APU GENERATOR OFF BUS

Turn the APU generator off, then on.

If the APU GEN OFF message persists, turn the APU generator off.

BATTERY 1 (2) DISCHARGING

Select the affected TRU to off and then to auto.

If the BATT 1 (2) DISCHARGING message persists, select the affected TRU to off.

BATTERY 1 OFF

Verify battery 1 is set to on.

NOTE: If battery 1 selector is off, APU start is not available.

BATTERY 2 OFF

Verify battery 2 is set to auto.

DC BUS 1 OFF

Disengage the autothrottle, set the emergency lights to off and limit the altitude to 31000 ft maximum.

NOTE: The slats will operate at low rate.

For landing configuration, arm the emergency lights, set slat/flap to full and $V_{REF\ FULL}$.

CAUTION: MULTIPLY THE FULL FLAPS UNFACTORED LANDING DISTANCE BY 1.15.

DC BUS 2 OFF

Disengage the autothrottle and limit the altitude to 31000 ft maximum.

For landing configuration, set slat/flap to full and $V_{REF\ FULL}$.

On ground, use differential braking and rudder to steer the airplane.

CAUTION: MULTIPLY THE FULL FLAPS UNFACTORED LANDING DISTANCE BY 1.20.

DC ESSENTIAL BUS 1 OFF

LAND AT THE NEAREST SUITABLE AIRPORT.

Exit and avoid icing conditions and set battery 1 to off.

(Continues on the next page)

(Continued from the previous page)

NOTE:
- Compass internal light will be lost.
- FADEC will set flight idle on ground.
- The flaps will operate at low rate.
- Engine 2 windmill start is not available.
- Thrust Reversers, Wing Anti-Ice and Ground Idle may not be available.
- Expect lower roll rates and lower speedbrake efficiency.
- Do not accomplish the Spoiler Fault Procedure.

For landing configuration, set slat/flap to full and $V_{REF\ FULL}$.

On ground, apply brakes normally.

CAUTION: MULTIPLY THE FULL FLAPS UNFACTORED LANDING DISTANCE BY 1.70.

DC ESSENTIAL BUS 2 OFF

LAND AT THE NEAREST SUITABLE AIRPORT.

Exit and avoid icing conditions and set battery 2 to off.

NOTE:
- The slats will operate at low rate.
- FADEC will set flight idle on ground.
- Engine 1 windmill start is not available.
- Thrust Reversers, Wing Anti-Ice and Ground Idle may not be available.
- Expect lower roll rates and lower speedbrake efficiency.
- Do not accomplish the Spoiler Fault Procedure.

Turn the APU off. For landing configuration, set slat/flap to full and $V_{REF\ FULL}$.

On ground, apply brakes normally.

CAUTION: MULTIPLY THE FULL FLAPS UNFACTORED LANDING DISTANCE BY 1.80.

DC ESSENTIAL BUS 3 OFF

Set the TRU ESS to off.

If DC ESSENTIAL BUS 3 OFF message persists, the flaps will operate at low rate.

GPU CONNECTED

Disconnect GPU before starting taxi.

IDG 1 (2) OFF BUS

Select the affected IDG to off and then to auto.

If the IDG 1 (2) OFF message persists, select the affected IDG to off and use APU as required.

IDG 1 (2) OIL

Disconnect the affected IDG.

TRU 1 (2) FAILURE

Select the affected TRU to off and then to auto.

If the TRU 1 (2) FAIL message persists, select the affected TRU to off.

TRU ESSENTIAL FAILURE

Select the TRU ESS to off.

ENGINE

TABLE OF CONTENTS

INTENTIONALLY BLANK

ENGINE 1 (2) REVERSER DEPLOYED

LAND AT THE NEAREST SUITABLE AIRPORT.

Disengage the autothrottle and set the affected thrust lever to idle.

If any buffeting is noticed, set the start stop selector (affected engine) to stop, start the APU and balance the fuel.

When appropriate, accomplish the One Engine Inoperative Approach and Landing Procedure.

ENGINE 1 (2) OIL LOW PRESSURE

If the affected oil pressure indication is abnormal, accomplish the Engine Shutdown Procedure.

ENGINE 1 (2) CONTROL FAULT

Disengage the autothrottle.

CAUTION: AVOID QUICK THRUST LEVER MOVEMENT, HIGH ENGINE THRUST OPERATION AND THRUST REVERSER**.**

If it is not possible to control engine thrust for the affected engine, accomplish the Engine Shutdown Procedure.

ENGINE 1 (2) FADEC OVERTEMPERATURE

If the respective engine parameters are abnormal, accomplish the Engine Shutdown Procedure.

CAUTION: IF THE ENGINE DOES NOT SHUTDOWN, PULL (DO NOT ROTATE) THE ASSOCIATED FIRE-EXTINGUISHING HANDLE**.**

ENGINE 1 (2) FAILURE

LAND AT THE NEAREST SUITABLE AIRPORT.

Reduce the associated thrust lever to idle.

If the affected engine was not succesfully restarted via autorelight, set the start/stop selectors to stop and start the APU.

If fuel leak is suspected, accomplish the Fuel Leak Procedure.

If fuel leak is not suspected and a restart is considered, accomplish the Engine Airstart Procedure.

If fuel leak is not suspected and a restart is not considered, accomplish the One Engine Inoperative Approach and Landing Procedure.

ENGINE 1 (2) FUEL IMPENDING BYPASS

If both ENG 1 FUEL IMP BYPASS and ENG 2 FUEL IMP BYPASS messages are displayed, LAND AT THE NEAREST SUITABLE AIRPORT.

ENGINE 1 (2) FUEL LOW PRESSURE

Verify the fuel crossfeed is off.

Disengage the autothrottle and monitor the affected engine parameters. If unable to sustain the desired thrust or if the parameters fluctuate, operate at lower altitude.

If fuel leak is suspected, accomplish the Fuel Leak Procedure.

ENGINE 1 (2) NO DISPATCH

Do not takeoff.

ENGINE 1 (2) OIL LOW LEVEL

Do not takeoff.

ENGINE 1 (2) REVERSER FAILURE

Do not takeoff.

ENGINE 1 (2) REVERSER PROTECTION FAULT

Do not takeoff.

ENGINE 1 (2) REVERSER THRUST LEVER ANGLE FAILURE

On ground, the associated thrust reverser is not available.

Inflight, do not move the thrust levers below idle.

ENGINE 1 (2) STARTER VALVE OPENED

Turn the crossbleed and the associated bleed off.

If the airplane is on ground and engine 1 is the affected engine, turn off APU bleed, reduce the engine 1 thrust lever to idle and set the engine 1 start/stop selector to stop.

If the airplane is on ground and engine 2 is the affected engine, remove the engine start ground cart and reduce engine 2 thrust lever to idle and set the engine 2 start/stop selector to stop.

If the airplane is inflight, turn APU bleed off, exit and avoid icing conditions and limit the altitude to 31000 ft maximum.

ENGINE 1 (2) THRUST LEVER ANGLE FAILURE

NOTE: The engine thrust will be set to idle automatically.

When appropriate, accomplish the One Engine Inoperative Approach and Landing Procedure.

ENGINE 1 (2) T2 HEATER FAILURE

Exit or avoid icing conditions.

ENGINE EXCEEDANCE

Do not takeoff.

ENGINE NO TAKEOFF DATA

Enter the Engine Takeoff Data.

ENGINE REFERENCE ANTI-ICE DISAGREE

Configure the airplane according to takeoff data or re enter the takeoff data according to airplane configuration.

ENGINE REFERENCE ECS DISAGREE

Configure the aircraft according to takeoff data or reenter the takeoff data according to aircraft configuration.

ENGINE THRUST LEVER ANGLE NOT TOGA

Move the thrust levers to TOGA position.

ENGINE THRUST RATING DISAGREE

Do not takeoff.

INTENTIONALLY BLANK

FIRE PROTECTION

TABLE OF CONTENTS

INTENTIONALLY BLANK

APU FIRE

ϕAPU Emergency Stop Button .... PUSH IN

Turn the APU off.

If the APU FIRE message persists, push the APU fire-extinguishing button.

ENGINE 1 (2) FIRE

ϕAutothrottle.. DISENGAGE
ϕThrust Lever (affected engine).................................... IDLE
ϕStart/Stop Selector (affected engine) .... STOP
ϕFire Extinguishing Handle (affected engine)............... PULL

LAND AT THE NEAREST SUITABLE AIRPORT.

Rotate the fire extinguishing handle (to the left or right).

Wait 30 seconds. If ENG 1(2) FIRE message persists, rotate the fire-extinguishing handle to the remaining bottle.

If high vibration occurs, reduce the airspeed. If vibration still persists, recommend reducing the airspeed below V_A.

If affected side Fuel Indication is lost, assume fuel is leaking from the affected side.

Use the APU, the autothrottle and fuel crossfeed as required.

When appropriate, accomplish the One Engine Inoperative Approach and Landing Procedure.

APU FIRE DETECTION FAILURE

Turn the APU off.

APU FIRE-EXTINGUISHING FAILURE

Turn the APU off.

CARGO AFT (FORWARD) FIRE SYSTEM FAILURE

If aft (forward) cargo compartment is not empty, LAND AT THE NEAREST SUITABLE AIRPORT.

ENGINE 1 (2) FIRE DETECTION FAILURE

If fire is suspected in the affected engine, accomplish the Engine Fire, Severe Damage or Separation Procedure.

FLIGHT CONTROLS

TABLE OF CONTENTS

INTENTIONALLY BLANK

ELEVATOR NORMAL MODE FAILURE

Push the flight controls mode elevators button in. Do not accomplish the Elevator Fault Procedure.

Accomplish the Angle of Attack Limit Failure Procedure.

GROUND SPOILERS FAILURE

Close the speed brake.

For landing configuration, set slat/flap to full and set $V_{REF\ FULL}$.

CAUTION: MULTIPLY THE FULL FLAPS UNFACTORED LANDING DISTANCE BY 1.30.

RUDDER NORMAL MODE FAILURE

Push the flight controls mode rudder button in. Do not accomplish the Rudder Fault Procedure.

SPOILER NORMAL MODE FAILURE

Close the speed brake.

Push the flight controls mode spoilers button in. Do not accomplish the Spoiler Fault Procedure.

For landing configuration, set slat/flap to full and set $V_{REF\ FULL}$.

CAUTION: MULTIPLY THE FULL FLAPS UNFACTORED LANDING DISTANCE BY 1.45.

ANGLE OF ATTACK LIMIT FAILURE

Avoid sideslipping the airplane.

NOTE: The stick shaker remains operative.

ELEVATOR THRUST COMPENSATOR FAILURE

Compensate manually any pitch tendency following thrust variations.

ELEVATOR FAULT

NOTE: If the SPOILER FAULT message is also displayed, accomplish the Spoiler Fault Procedure prior to this procedure.

Reset (push in, then out) the flight controls mode elevators button one time.

If the ELEVATOR FAULT message persists, accomplish the Angle of Attack Limit Failure Procedure.

ELEVATOR LH (RH) FAILURE

If the failure occurs above 175 KIAS, the current airspeed is the maximum speed for the remainder of the flight.

If the failure occurs below 175 KIAS, the maximum speed for the remainder of the flight is 175 KIAS.

NOTE: Expect less elevator control authority and slower response, especially during landing flare.

For landing configuration, set slat/flap to 5 and set $V_{REF\ FULL}$ + 15 KIAS. Apply brakes only after the nose landing gear touches down.

CAUTION: MULTIPLY THE FULL FLAPS UNFACTORED LANDING DISTANCE BY 1.40.

If a go around is required, set slat/flap to 4 and maintain $V_{REF\ FULL}$ + 15 KIAS until the acceleration altitude is reached.

FLAP (SLAT) FAILURE

Return to the previous position and after reselect the desired position. This can be attempted up to two times.

If the FLAP (SLAT) FAIL message persists, use the position indicated on the EICAS as a reference to select landing data presented on the tables below. If there is no flap (slat) indication in the EICAS, use the more conservative position to enter the table.

Limit Bank angle to 20° maximum. If applicable, push in the Gnd Prox Flap Ovrd Button.

If a go around is required, maintain the Slat/Flap lever in the selected position and set the V_{REF} presented in the table until the level off.

FLAP/SLAT FAIL LANDING TABLE

	FLAP \ SLAT	0	3	FULL
V_{REF} (KIAS)	0	$V_{REF\ FULL}$ + 60	$V_{REF\ FULL}$ + 50	$V_{REF\ FULL}$ + 50
Ldg Coef		1.85	1.74	1.72
V_{REF} (KIAS)	1	$V_{REF\ FULL}$ + 35	$V_{REF\ FULL}$ + 35	$V_{REF\ FULL}$ + 35
Ldg Coef		1.53	1.51	1.50
V_{REF} (KIAS)	2	$V_{REF\ FULL}$ + 30	$V_{REF\ FULL}$ + 25	$V_{REF\ FULL}$ + 20
Ldg Coef		1.38	1.55	1.28
V_{REF} (KIAS)	3, 4 and 5	NOT USABLE	$V_{REF\ FULL}$ + 15	$V_{REF\ FULL}$ + 10
Ldg Coef			1.31	1.29
V_{REF} (KIAS)	FULL		$V_{REF\ FULL}$ + 5	$V_{REF\ FULL}$
Ldg Coef			1.06	NOT APPLICABLE

(Continues on the next page)

(Continued from the previous page)

FLAP/SLAT FAIL LANDING TABLE WITH SHAKER ANTICIPATED

	FLAP \ SLAT	0	3	FULL
V_{REF} (KIAS)	0	$V_{REF\ FULL}$ + 60	$V_{REF\ FULL}$ + 60	$V_{REF\ FULL}$ + 60
Ldg Coef		1.85	1.83	1.82
V_{REF} (KIAS)	1	$V_{REF\ FULL}$ + 40	$V_{REF\ FULL}$ + 40	$V_{REF\ FULL}$ + 40
Ldg Coef		1.62	1.60	1.60
V_{REF} (KIAS)	2	$V_{REF\ FULL}$ + 30	$V_{REF\ FULL}$ + 25	$V_{REF\ FULL}$ + 25
Ldg Coef		1.38	1.55	1.57
V_{REF} (KIAS)	3, 4 and 5	NOT USABLE	$V_{REF\ FULL}$ + 15	$V_{REF\ FULL}$ + 10
Ldg Coef			1.31	1.29
V_{REF} (KIAS)	FULL		$V_{REF\ FULL}$ + 5	$V_{REF\ FULL}$
Ldg Coef			1.06	NOT APPLICABLE

FLT CTRL NO DISPATCH

Do not takeoff.

PITCH TRIM FAILURE

If the failure occurs above 175 KIAS, the current airspeed is the maximum speed for the remainder of the flight.

If the failure occurs below 175 KIAS, the maximum speed for the remainder of the flight is 175 KIAS.

Reset (push in, then out) the pitch trim system 1 and 2 cutout buttons.

Actuate pitch trim switches.

If pitch trim is not moving upon command, push in the pitch trim system 1 and 2 cutout buttons. No more pitch trim is available.

For landing configuration, set slat/flap to 5 and set $V_{REF\ FULL}$ + 15 KIAS.

CAUTION: MULTIPLY THE FULL FLAPS UNFACTORED LANDING DISTANCE BY 1.40.

Establish landing configuration early.

If a go around is required, set slat/flap to 4 and maintain $V_{REF\ FULL}$ + 15 KIAS until the acceleration altitude is reached.

RUDDER FAILURE

LAND AT THE NEAREST SUITABLE AIRPORT.

If the failure occurs above 175 KIAS, the current airspeed is the maximum speed for the remainder of the flight.

If the failure occurs below 175 KIAS, the maximum speed for the remainder of the flight is 175 KIAS.

For landing configuration, set slat/flap to full and set $V_{REF\ FULL}$.

CAUTION: AVOID LANDING WITH CROSSWIND COMPONENTS ABOVE 10 KT.

If a go around is required, proceed as a normal go around limiting the airspeed to 175 KIAS.

NOTE: As asymmetric thrust may be required to help controlling the airplane, maximum thrust on both engines may not be possible.

RUDDER FAULT

NOTE: If the SPOILER FAULT message is also displayed, accomplish the Spoiler Fault procedure prior to this procedure.

Reset (push in, then out) the flight controls mode rudder button one time.

If the RUDDER FAULT message persists and is associated with the RUDDER LIMITER FAIL message, reset (push in, then out) the flight controls mode rudder button once again.

RUDDER LIMITER FAILURE

Rudder position limiter is inoperative and rudder authority in flight is 30°.

CAUTION: • DO NOT APPLY ABRUPT PEDAL COMMANDS.
• DO NOT APPLY FULL RUDDER DEFLECTION.

SLAT-FLAP LEVER DISAGREE

Return the slat/flap lever to previous position and then use it as required.

SPOILER FAULT

Close the speedbrake and disengage the autopilot.
Reset (push in, then out) the flight controls mode spoilers button one time.

If the SPOILER FAULT message persists:

If any spoiler panel is failed opened or if it is not possible to determine the spoiler panel position, for landing configuration set slat/flap to 5 and set $V_{REF\ FULL}$ + 15 KIAS.

CAUTION: MULTIPLY THE FULL FLAPS UNFACTORED LANDING DISTANCE BY 1.78.

If all spoiler panels are closed, for landing configuration set slat/flap to full and set $V_{REF\ FULL}$.

CAUTION: MULTIPLY THE FULL FLAPS UNFACTORED LANDING DISTANCE BY 1.45.

STABILIZER LOCK FAULT

LAND AT THE NEAREST SUITABLE AIRPORT.

The Horizontal Stabilizer may have a drift rate up to 0.5 deg/min nose up or nose down.

Use pitch trim as required.

CAUTION: DO NOT PRESS ANY PITCH TRIM SYSTEM CUTOUT BUTTON.

AILERON RH (LH) FAILURE

On ground, do not takeoff.

Inflight:

Avoid abrupt and large aileron inputs and limit bank angle to 25°.

Establish landing configuration early. For landing configuration, set slat/flap 5 and maintain $V_{REF\ FULL}$ + 10 KIAS.

CAUTION: MULTIPLY THE FULL FLAPS UNFACTORED LANDING DISTANCE BY 1.30.

FLIGHT CONTROL FAULT

Do not takeoff.

FMS/NAV/COM & FLIGHT INSTRUMENTS

TABLE OF CONTENTS

CAUTION

ADVISORY

NO TAKEOFF CONFIGURATION

Configure the airplane for takeoff.

ADS 1 (2) FAILURE

Confirm the affected ADS automatic reversion. If necessary, revert the affected ADS.

ADS 3 FAILURE

If necessary, revert ADS 3.

ADS 1 (2) (3) HEATER FAILURE

Revert the affected ADS.

ADS 4 HEATER FAILURE

Disregard IESS altitude and airspeed indication.

AIRPLANE PERSONALITY MODULE FAILURE

Do not takeoff.

AIRPLANE PERSONALITY MODULE MISCOMPARISON

Do not takeoff.

AURAL WARNING SYSTEM FAILURE

Monitor visual indications.

NOTE: Aural warnings, including EGPWS callouts, are lost. TCAS aural will be operative.

AVIONICS ASCB FAULT

Do not takeoff.

AVIONICS MAU 1A FAILURE

Exit and avoid icing conditions.

For landing configuration, set slat/flap to full and set $V_{REF\ FULL}$.

On ground, steer the airplane using rudder and differential braking apply brakes normally.

CAUTION: MULTIPLY THE FULL FLAPS UNFACTORED LANDING DISTANCE BY 1.70.

AVIONICS MAU 1B FAILURE

For landing configuration, set slat/flap to full and set V_{REF}.

CAUTION: MULTIPLY THE FULL FLAPS UNFACTORED LANDING DISTANCE BY 1.15.

AVIONICS MAU 2A FAILURE

On ground, steer the airplane using rudder and differential braking.

AVIONICS MAU 2B FAILURE

For landing configuration, set slat/flap to full and set $V_{REF\ FULL}$.

On ground, apply brakes normally.

CAUTION: MULTIPLY THE FULL FLAPS UNFACTORED LANDING DISTANCE BY 1.65.

AVIONICS MAU 3A FAILURE

Exit and avoid icing conditions.

For landing configuration, set slat/flap to full and set $V_{REF\ FULL}$.

CAUTION: MULTIPLY THE FULL FLAPS UNFACTORED LANDING DISTANCE BY 1.20.

AVIONICS MAU 3B FAILURE

For landing configuration, set slat/flap to full and set $V_{REF\ FULL}$.

CAUTION: MULTIPLY THE FULL FLAPS UNFACTORED LANDING DISTANCE BY 1.20.

AVIONICS MAU 1 (2) (3) A (B) OVERHEAT

Pull the associated circuit breaker and accomplish the associated Avionics MAU Failure Procedure.

AVIONICS MAU 1 (2) (3) FAN FAILURE

Do not takeoff.

COMMUNICATION MANAGEMENT SYSTEM FAILURE

Do not takeoff.

CREW WARNING SYSTEM FAULT

Do not takeoff.

DISPLAY CONTROL FAILURE

NOTE: - PFD selections of VOR, FMS, RA/BARO Minimuns and Baro Setting will be locked at the last setting position prior to the failure.
- Disregard altitude callouts from aural system.
- Use IESS for barometric setting and ILS approach.

DISPLAY CONTROL FAULT

Do not takeoff.

EICAS FAULT

Crosscheck EICAS information and revert if necessary.

EICAS OVERHEAT

Pull B11 CB and revert the EICAS.

FMS POSITION DISAGREE

Do not use FMS as navigation source.

FMS 1(2)-GPS POSITION DISAGREE

If the aircraft is equipped with dual FMS, select another FMS source.

If the aircraft is equipped with single FMS, select another navigation source.

GROUND PROXIMITY FAILURE

Increase awareness in relation to ground proximity.

IRS EXCESSIVE MOTION

Stop the airplane until the alignment is completed.

IRS 1 (2) FAILURE

Revert the affected IRS.

MCDU 1 (2) OVERHEAT

(PRE-MOD. SB 170-31-0017)

Pull the associated circuit breaker.

For MCDU 1 OVHT, pull the B16 CB.

For MCDU 2 OVHT, pull the B31 CB.

MFD 1 (2) FAULT

Crosscheck the affected MFD display information (System Synoptics, MAP, TAS, TAT, SAT, TCAS info, WX radar and Terrain Data) with the opposite side MFD display information. Disregard any non-reliable information from the affected MFD.

MFD 1 (2) OVERHEAT

Pull the associated circuit breaker and revert the affected MFD if necessary.

For MFD 1 OVHT, pull the B29 CB.

For MFD 2 OVHT, pull the B20 CB.

NAVCOM 1 (2) FAILURE

Select and use the remaining NAVCOM (VHF, VOR, DME, Transponder).

NAVCOM 1 (2) OVERHEAT

Pull the associated circuit breaker.

For NAVCOM 1 OVHT, pull the C10 CB.

For NAVCOM 2 OVHT, pull the MRC 2 Electronic CB.

Accomplish the NAVCOM 1 (2) FAILURE Procedure.

PFD 1 (2) FAULT

Crosscheck the affected PFD display information (Attitude, Airspeed, Altitude, FMA, FPA, Minimuns, Baro setting, Nav-Com radios frequencies, HDG and CRS) with the opposite side PFD display information. Disregard any non-reliable information from the affected PFD.

PFD 1 (2) OVERHEAT

Pull the associated circuit breaker and revert the affected PFD if necessary.

For PFD 1 OVHT, pull the B19 CB.

For PFD 2 OVHT, pull the B21 CB.

SYSTEM CONFIGURATION FAILURE

Do not takeoff.

TERRAIN FAILURE

Increase awareness in relation to terrain proximity.

VALIDATE CONFIGURATION

Do not takeoff.

VHF 3 FAILURE

Select another VHF source.

VHF 1 (2) (3) OVERHEAT

Pull the associated circuit breaker.

For VHF 1 OVHT, pull the C11 CB.

For VHF 2 OVHT, pull the VHF 2 Electronic CB.

For VHF 3 OVHT, pull the VHF 3 Electronic CB.

WINDSHEAR FAILURE

Increase awareness in relation to weather, wind and speed variations.

ADS PROBE 1 (2) (3) (4) FAILURE

Do not takeoff.

INTENTIONALLY BLANK

FUEL

TABLE OF CONTENTS

INTENTIONALLY BLANK

FUEL 1 (2) LOW LEVEL

LAND AT THE NEAREST SUITABLE AIRPORT.

CAUTION: AVOID ATTITUDES IN EXCESS OF 15° NOSE UP OR DOWN, UNCOORDINATED MANEUVERS AND NEGATIVE G´S.

Turn ON the associated fuel AC pump and in case of further fuel starvation, turn the associated fuel AC pump back to AUTO.

If fuel leak is suspected, accomplish the Fuel Leak Procedure.

If fuel leak is not suspected, operate fuel crossfeed as required.

APU FUEL SHUTOFF VALVE FAILURE

Do not restart the APU.

ENGINE 1 (2) FUEL SHUTOFF VALVE FAILURE

If the ENG 1 (2) FUEL SOV FAIL message was displayed after pulling the associated engine fire handle, select the associated fuel AC electric pump and the fuel crossfeed to off.

If the ENG 1 (2) FUEL SOV FAIL message was not displayed after pulling the associated engine fire handle, continue the flight monitoring the system.

FUEL AC PUMP 1 (2) FAILURE

Select the crossfeed selector to OFF.

FUEL DC PUMP FAILURE

Turn the fuel DC pump off.

FUEL IMBALANCE

If fuel leak is suspected, accomplish the Fuel Leak Procedure

If fuel leak is not suspected, set the airplane attitude to wings level and compare total fuel quantity indication on EICAS with fuel remaining information indicated on FMS Fuel Management page. If FMS fuel remaining quantity is lower than EICAS total fuel indication, disregard FMS fuel remaining information. Monitor fuel quantities using the EICAS indications.

If left wing presents lower level, set the crossfeed selector to LOW 1.

If right wing presents lower level, set the crossfeed selector to LOW 2.

Monitor fuel imbalance and, when the desired balance is achieved, set the crossfeed selector to off. Monitor total fuel indication in EICAS with FMS fuel remaining information.

NOTE: - The guidance to compare the total fuel quantity indication on EICAS with fuel remaining information indicated on FMS Fuel Management page is not valid when flying with one engine inoperative. In this case only the fuel indications presented on EICAS must be used.
- Crossfeed performance may be reduced in a high thrust asymmetry condition with both engines operating. On those conditions fuel imbalance above 793 lb (360 kg) may be observed.
- Crossfeed performance is restored with any thrust reduction below maximum continuous.

FUEL TANK LOW TEMPERATURE

Increase airspeed as much as possible up to V_{MO}/M_{MO} and wait 3 minutes.

If the FUEL TANK LO TEMP message persists, descend to lower altitudes.

FUEL CROSSFEED FAILURE

If fuel crossfeed is set to LOW 1 or LOW 2 and fuel quantity is being equalized, set the fuel crossfeed to OFF when appropriate.

If fuel crossfeed is set to LOW 1 or LOW 2 and fuel quantity is not being equalized, set the fuel crossfeed to OFF and use asymmetric thrust as required.

HYDRAULICS

TABLE OF CONTENTS

THIS PAGE INTENTIONALLY LEFT BLANK

HYDRAULIC SYSTEM 1 OR 2 OVERHEAT

Set the associated electric hydraulic pump to off and push the associated engine pump shutoff button in.

If HYD 1 (2) SOV FAIL message is presented, LAND AT THE NEAREST SUITABLE AIRPORT and accomplish the Engine Shutdown Procedure.

Accomplish the appropriate Loss of Hydraulic System Procedure.

HYDRAULIC SYSTEM 3 OVERHEAT

Set the electric hydraulic system 3 pump A and pump B to off.

Accomplish the Loss of Hydraulic System 3 Procedure.

HYDRAULIC PTU FAILURE

Turn the PTU on.

If the message HYD PTU FAIL persists, turn the PTU to OFF.

NOTE: During cruise flight, if PTU is commanded ON, it may be turned to AUTO.

HYDRAULIC 1 (2) EDP NOT D-PRESSED

An engine windmill restart will not be available.

HYDRAULIC 1 (2) HIGH TEMPERATURE

Turn the associated electric hydraulic pump off.

HYDRAULIC 3 HIGH TEMPERATURE

Turn the electric hydraulic pump 3A off.

HYDRAULIC 1 (2) LOW PRESSURE

Turn the associated electric hydraulic pump on.

If the HYD 1 (2) LO PRESS message persists, turn the associated electric hydraulic pump off and accomplish the appropriate Loss of Hydraulic System Procedure.

HYDRAULIC 3 LOW PRESSURE

Turn the electric hydraulic pump 3B on and turn the electric hydraulic pump 3A off.

If the HYD 3 LO PRESS message persists, turn the electric hydraulic pump 3B off and accomplish the Loss of Hydraulic 3 System Procedure.

HYDRAULIC 3 VALVE FAILED

Maintain 130 KIAS minimum.

HYDRAULIC TEMPERATURE SENSORS FAILURE

Do not takeoff.

THIS PAGE INTENTIONALLY LEFT BLANK

ICE & RAIN PROTECTION

TABLE OF CONTENTS

INTENTIONALLY BLANK

ANTI-ICE WING 1 (2) LEAK

Push out the wing ice protection button and avoid/exit icing conditions. For landing configuration, if icing conditions are presented or there is ice accretion, plan a flap 5 landing and maintain $V_{REF\ FLAP\ 5\ ICE}$.

CAUTION: MULTIPLY THE FULL FLAPS UNFACTORED LANDING DISTANCE BY 1.30.

If A-I WING 1 (2) LEAK message persists, push out the affected side bleed button, push out the crossbleed button and limit the altitude to 31000 ft maximum. If bleed 1 is the affected bleed, push out the APU bleed button.

ANTI-ICE ENGINE 1 (2) FAILURE

Reset (push out, then in) the affected ice protection engine button.

If the A-I ENG 1 (2) FAIL message persists, set the ice protection mode selector to on.

Then, if A-I ENG 1 (2) FAIL message still persists, exit and avoid icing conditions. If also high engine vibration exists, accomplish the Engine Abnormal Vibration Procedure.

After exiting icing conditions, set the ice protection mode selector to auto.

ANTI-ICE LOW CAPACITY

Advance the thrust levers.

ANTI-ICE WING FAILURE

Reset (push out, then in) the ice protection wing button.

If A-I WING FAIL message persists, set the ice protection mode selector to on.

Then, if A-I WING FAIL message extinguishes, set the ice protection mode selector to auto after exiting icing conditions.

If A-I WING FAIL message still persists, set the ice protection mode selector to auto, push the ice protection wing button out and avoid/exit icing conditions. During landing, if icing conditions are presented or there is ice accretion, plan a flap 5 landing and maintain $V_{REF\ FLAP\ 5\ ICE}$.

CAUTION: MULTIPLY THE FULL FLAPS UNFACTORED LANDING DISTANCE BY 1.30.

Limit bank angle to 20° maximum.

ICE DETECTOR 1 (2) FAILURE

When flying in icing conditions, select the ice protection mode to on and select it to auto 2 minutes after exiting icing conditions.

WINDSHIELD 1 (2) HEATER FAILURE

Push the affected windshield-heating button out and then push in.

If the WINDSHIELD 1 (2) HTR FAIL message persists, push the affected windshield-heating button out.

INTENTIONALLY BLANK

LANDING GEAR & BRAKES

TABLE OF CONTENTS

INTENTIONALLY BLANK

LANDING GEAR LEVER DISAGREE

Cycle the landing gear lever.

If the LG LEVER DISAG message persists and it was displayed after a landing gear extension, accomplish the Abnormal Landing Gear Extension Procedure.

If the LG LEVER DISAG message persists and it was displayed after a landing gear retraction, maintain landing gear down and avoid/exit icing conditions.

AUTOBRAKE FAILURE

Apply brakes normally.

BRAKE LH (RH) FAILURE

NOTE: Thrust reverser may also be used to stop the airplane.

During landing run gradually apply the normal brake, using rudder pedals to steer the airplane.

For landing configuration, set slat/flap to full and set $V_{REF\ FULL}$.

CAUTION: MULTIPLY THE FULL FLAPS UNFACTORED LANDING DISTANCE BY 1.65.

BRAKE OVERHEAT

If the airplane is on ground, stop the airplane; put chocks on and set the emergency/parking brake to off.

If the airplane is in flight, set the landing gear to down and wait 5 minutes after the BRK OVERHEAT message is no longer displayed to retract the landing gear.

EMERGENCY BRAKE FAILURE

When parking the airplane, use wheel chocks.

LANDING GEAR NO DISPATCH

Do not takeoff.

LANDING GEAR NOSE DOOR OPENED

Maintain 250 KIAS maximum and do not move the landing gear lever up.

NOTE: If climb performance is required to clear obstacles, the landing gear lever can be moved up.

LANDING GEAR WEIGHT-ON-WHEEL SYSTEM FAILURE

LAND AT THE NEAREST SUITABLE AIRPORT.

Exit and avoid icing conditions.

For landing configuration, set slat/flap to full and set $V_{REF\ FULL}$.

CAUTION: MULTIPLY THE FULL FLAPS UNFACTORED LANDING DISTANCE BY 1.30.

NOTE: Thrust Reversers, Steering, Ground Spoilers, Wing Anti-Ice and Ground Idle may not be available.

STEERING FAILURE

Steer the airplane using differential braking and rudder.

BRAKE CONTROL FAULT

Apply brakes normally.

For landing configuration, set slat/flap to full and set $V_{REF\ FULL}$.

BRAKE LH (RH) FAULT

During landing run, expect a slight directional tendency. Apply brakes normally.

CAUTION: MULTIPLY THE FULL FLAPS UNFACTORED LANDING DISTANCE BY 1.28.

OXYGEN

TABLE OF CONTENTS

THIS PAGE INTENTIONALLY LEFT BLANK

CREW OXYGEN LOW PRESSURE

Limit altitude to 10000 ft or MEA (whichever is higher) maximum, whichever is higher.

PASSENGER OXYGEN NOT DEPLOYED

If required, deploy the passenger oxygen masks manually.

OBSERVER OXYGEN LOW PRESSURE

If the observer seat is occupied, limit altitude to 10000 ft or MEA (whichever is higher) maximum.

THIS PAGE INTENTIONALLY LEFT BLANK

SMOKE PROCEDURES

TABLE OF CONTENTS

INTENTIONALLY BLANK

CARGO FORWARD (AFT) SMOKE

ϕAssociated Cargo Fire Extinguishing Button............... PUSH

LAND AT THE NEAREST SUITABLE AIRPORT.

LAVATORY SMOKE

Establish contact with the cabin crew.

If necessary, consider a diversion and accomplish the Smoke Evacuation Procedure.

SMOKE EVACUATION

ϕCrew Oxygen Masks.. DON, EMER
ϕCrew Communication.. ESTABLISH
ϕPressurization Dump Button .... PUSH IN

LAND AT THE NEAREST SUITABLE AIRPORT.

Close the cockpit door and check the cabin rate.

If cabin rate is less than 1000 ft/min, set the pressurization to manual and turn the recirculation fan and both packs off.

Accomplish the Emergency Descent Procedure.

SMOKE, FIRE OR FUMES

ϕCrew Oxygen Masks .... DON, 100%
ϕCrew Communication... ESTABLISH

LAND AT THE NEAREST SUITABLE AIRPORT.

Push the recirculation fan button out.

If smoke origin is identified, remove the affected source and if applicable, perform the Smoke Evacuation Procedure.

If smoke origin is not identified:

Emergency Descent Procedure .... ACCOMPLISH
Pressurization DUMP Button .... PUSH IN
Bleed 1 and 2 Button.. PUSH OUT
Emergency Lights .... OFF
RAT Manual Lever .... PULL
Airspeed.. 130 KIAS MINIMUM
IDG 1 and 2 Selectors.. OFF
APU Gen Button... PUSH OUT

NOTE: Do not accomplish the Electrical Emergency Procedure.

If BATT DISCHARGING message is displayed in the EICAS, set IDG 1 or 2 selector to auto.

If able to land soon or smoke stops or decreases:

Icing Conditions .... EXIT/AVOID

Landing configuration:

Emergency Lights .... ARMED
Ground Proximity Flap Override Button.......... PUSH IN
Slat/flap Lever 3
Set $V_{REF\ FULL}$ + 20 KIAS or 130 KIAS (whichever is higher).

CAUTION: MULTIPLY THE FULL FLAPS UNFACTORED LANDING DISTANCE BY 2.10.

NOTE: On ground, steer the airplane using differential braking and rudder.

(Continues on the next page)

(Continued from the previous page)

If a go around is required:

Slat/flap Lever 3
$V_{REF\ FULL}$ + 20 KIAS or 130 KIAS (whichever is higher) until the acceleration altitude is reached.

If smoke persists and unable to land soon:

Both IDG Selectors .... AUTO
DC Bus Ties Switch .... OFF
TRU 1 Switch .... OFF
Battery 1... OFF

If smoke stops or decreases:

Perform the DC BUS 1 OFF and DC ESS BUS 1 OFF Procedures, except the landing configurations.

Landing configuration:

Emergency Lights .... ARMED
Ground Proximity Flap Override Button .... PUSH IN
Slat/flap Lever 3
Set $V_{REF\ FULL}$ + 20 KIAS.

CAUTION: MULTIPLY THE FULL FLAPS UNFACTORED LANDING DISTANCE BY 2.30.

If smoke persists:

Battery 1 ....ON
TRU 1 Switch ....AUTO
TRU 2 Switch ....OFF
Battery 2 ....OFF

If smoke stops or decreases:

Perform the DC BUS 2 OFF and DC ESS BUS 2 OFF Procedures, except the landing configurations.

Icing Conditions ....EXIT/AVOID

Landing configuration:

Emergency Lights................................ ARMED
Ground Proximity Flap Override Button .... PUSH IN
Slat/flap Lever..................................... 3

(Continues on the next page)

(Continued from the previous page)

Set $V_{REF\ FULL}$ + 20 KIAS.

CAUTION: MULTIPLY THE FULL FLAPS UNFACTORED LANDING DISTANCE BY 2.50.

If smoke persists:

Battery 2 .... AUTO
TRU 2 Switch .... AUTO
TRU ESS Switch .... OFF

If smoke stops or decreases:

Landing configuration:

Emergency Lights........................... ARMED
Ground Proximity Flap
Override Button...........................PUSH IN
Slat/flap Lever 3
Set $V_{REF\ FULL}$ + 20 KIAS.

CAUTION: MULTIPLY THE FULL FLAPS UNFACTORED LANDING DISTANCE BY 2.10.

If smoke persists:

WARNING: CONSIDER AN IMMEDIATE LANDING.

TRU ESS Switch.................................. AUTO
TRU Bus Ties Switch........................... AUTO

Landing configuration:

Emergency Lights........................... ARMED
Ground Proximity Flap
Override Button...........................PUSH IN
Slat/flap Lever 3
Set $V_{REF\ FULL}$ + 20 KIAS.

CAUTION: MULTIPLY THE FULL FLAPS UNFACTORED LANDING DISTANCE BY 2.10.

(Continues on the next page)

(Continued from the previous page)

If a go around is required:

Slat/flap Lever........................... 3
$V_{REF\ FULL}$ + 20 KIAS until the acceleration altitude is reached.

RECIRCULATION SMOKE

LAND AT THE NEAREST SUITABLE AIRPORT
Recirc Fan Button .... PUSH OUT

SECTION 5

PERFORMANCE

TABLE OF CONTENTS

INTRODUCTION

The performance information given in this Section is applicable and common to all EMBRAER 170 and EMBRAER 175 models. For performance information related to the EMBRAER 170 or EMBRAER 175 equipped with specific engine model, refer to the Supplement 1 - CAFM.

The performance data are based on the following conditions:

- Pertinent power less installation, air bleed, and accessory losses.
- Full temperature accountability within the operational limits for which the airplane is certified.
- For landing, full brake application after touchdown.

The performance information is not valid if:

- The airplane's gross weight exceeds the appropriate maximum allowable limits.
- Any of the limitations in Section 2 is not observed.
- A reading from any graph is obtained by extrapolation (i.e. using values of parameters outside the range given on the graph).

NOTE: In the case of headwind components, the airplane may be operated in reported components greater than 30 kt, but the effect of only 30 kt may be taken.

PERFORMANCE CONFIGURATION

The configurations applicable to each performance phase are shown below.

	OPERATING ENGINES	TLA	FLAPS	GEAR	AIRSPEED
TAKEOFF RUN	2 until V_{EF}, 1 after V_{EF}	TOGA	1, 2, or 4	DOWN	0 TO V_{LOF}
1ST SEGMENT	1	TOGA	1, 2, or 4	DOWN TO UP	V_{LOF} TO V_2
2ND SEGMENT	1	TOGA	1, 2, or 4	UP	V_2
3RD SEGMENT	1	TOGA	TAKEOFF FLAPS TO 0	UP	V_2 TO FINAL SEGMENT SPEED
FINAL SEGMENT	1	MAX CON	0	UP	FINAL SEGMENT SPEED
ENROUTE	1	MAX CON	0	UP	ENROUTE CLIMB SPEED
APPROACH CLIMB	1	TOGA	2 or 4 (1)	UP	APPROACH CLIMB SPEED
LANDING CLIMB	2	TOGA	5 or FULL	DOWN	LANDING CLIMB SPEED
LANDING	2	IDLE	5 or FULL	DOWN	V_{REF}

NOTE: For landing flaps 5 or FULL the approach climb flap setting is 2 or 4, respectively.

DEFINITIONS

TEMPERATURES

OUTSIDE AIR TEMPERATURE - OAT or SAT

Free static air (ambient) temperature.

INTERNATIONAL STANDARD ATMOSPHERE - ISA

As accepted by the International Civil Aviation Organization.

ISA DEVIATION - △ISA

Temperature deviation from the standard temperature defined for ISA, at the specified altitude. Positive △ISA means higher temperatures than the standard.

AIRSPEED

INDICATED AIRSPEED - KIAS

It is reading on the airspeed indicator (knots), as installed in the airplane, uncorrected for the anemometric system position error. Zero instrument error is assumed by the CAFM.

CALIBRATED AIRSPEED - KCAS

It is the indicated airspeed corrected for the anemometric system position error.

EQUIVALENT AIRSPEED - EAS

It is the calibrated airspeed corrected for adiabatic compressible flow for the particular altitude. At sea level, the equivalent airspeed is equal to the calibrated airspeed.

TRUE AIRSPEED - TAS

It is the airplane speed in relation to the air and equal to the equivalent air speed corrected for air density. At sea level, ISA, the true airspeed is equal to the equivalent airspeed.

GROUND SPEED - GS

It is the airplane speed in relation to the ground. It is the true airspeed corrected by the wind speed.

AIRPORT DECLARED FIELD DATA

TAKEOFF RUN AVAILABLE - TORA

The runway length declared available and suitable for the ground run of an airplane taking off.

TAKEOFF DISTANCE AVAILABLE - TODA

The length of the runway plus the length of any available clearway, except that the length of any clearway included must not be greater than one-half the length of the runway.

ACCELERATE STOP DISTANCE AVAILABLE - ASDA

It is the takeoff run available (TORA) plus the available stopway length. If the stopway surface characteristics are substantially different from those of the runway, implying that the airplane braking capabilities on the stopway surface might be different from those of the runway, then the available stopway length cannot be added to the TORA, and the ASDA will be equal to the TORA.

LANDING DISTANCE AVAILABLE - LDA

The runway length declared available and suitable for a landing airplane, taking into account the obstruction in its approach path.

STOPWAY

It is an area beyond the takeoff runway, no less wide than the runway and centered upon the extended centerline of the runway, able to support the airplane during an aborted takeoff, without causing structural damage to the airplane, and designated by the airport authorities for use in decelerating the airplane during an aborted takeoff. CAFM considers that the stopway surface presents the same braking capabilities as the runway surface. Therefore, for CAFM use, the surface characteristics of the stopway cannot be substantially different from those of the runway, because no correction factor is considered by the software, concerning different airplane braking capabilities on the stopway surface.

CLEARWAY

It is an area beyond the runway, not less than 500 ft wide, centrally located about the extended centerline of the runway, and under the control of the airport authorities. It is expressed in terms of a clear way plane extending from the end of the runway with an upward slope not exceeding 1.25%, above which no object or terrain protrudes. Threshold lights may protrude above this plane if their height above the end of the runway is 26” or less, and if located to each side of the runway.

RUNWAY SLOPE

It is the airport takeoff field surface inclination at the takeoff run direction, in relation to the horizontal, expressed in percent. Uphill slopes are positive, downhill slopes are negative.

TAKEOFF AND LANDING DISTANCES

TAKEOFF DISTANCE ONE ENGINE INOPERATIVE (DRY RUNWAY) - TOD/OEI

It is the distance along the takeoff path from the start of takeoff to the point at which the airplane is 35 ft above the takeoff surface, at a speed not less than V_2, and the critical engine having failed at V_{EF}.

TAKEOFF DISTANCE ONE ENGINE INOPERATIVE (WET OR CONTAMINATED RUNWAY) - TOD/OEI

It is the distance along the takeoff path from the start of takeoff to the point at which the airplane is 15 ft above the takeoff surface, the critical engine having failed at V_{EF}.

TAKEOFF DISTANCE ALL ENGINES OPERATING - TOD/AEO

It is 115% of the distance along the takeoff path, with all engines operating, from the start of takeoff to the point at which the airplane is 35 ft above the takeoff surface.

TAKEOFF RUN ONE ENGINE INOPERATIVE (DRY RUNWAY)

It is the gross distance along the takeoff path from the start of takeoff to the mid point between lift off and the point at which the airplane is 35 ft above the takeoff surface, the critical engine having failed at V_{EF}.

TAKEOFF RUN ONE ENGINE INOPERATIVE (WET OR CONTAMINATED RUNWAY)

It is the same as the takeoff distance with one engine inoperative, wet or contaminated runway.

TAKEOFF RUN ALL ENGINES OPERATING

It is 115% of the distance along the takeoff path, with all engines operating, from the start of takeoff to the mid point between lift off and the point at which the airplane is 35 ft above the takeoff surface.

ACCELERATE STOP DISTANCE ONE ENGINE INOPERATIVE (ASD/OEI)

It is the distance necessary to accelerate from a standing start to V_{EF} with all engines operating, accelerate from V_{EF} to V_1 assuming the critical engine fails at V_{EF}, take the first action to abort the takeoff at V_1 and come to full stop.

ACCELERATE STOP DISTANCE ALL ENGINES OPERATING (ASD/AEO)

It is the distance necessary to accelerate from a standing start to V_1 with all engines operating, take the first action to abort the takeoff at V_1 and come to full stop.

BALANCED FIELD LENGTH (OR BALANCED RUNWAY)

It is a runway which takeoff distance available (TODA) is equal to the accelerate-stop distance available (ASDA). Otherwise the runway is defined as an Unbalanced Runway.

BALANCED TAKEOFF

It is a takeoff where the takeoff distance with one engine inoperative (TOD/OEI) is equal to the greater of the accelerate-stop distances (ASD/OEI or ASD/AEO). Otherwise the takeoff is defined as an Unbalanced Takeoff.

ALIGNMENT ALLOWANCE

It is the runway length distance that is lost when the airplane maneuvers into the runway prior to takeoff. There are two alignments distances:

- ASDA Alignment: is the distance from the airplane nose landing gear to the start of the runway surface. This allowance is subtracted from the accelerate-stop distance available.
- TODA Alignment: is the distance from the airplane main landing gear to the start of the runway surface. This allowance is subtracted from the takeoff run available (TORA) and from the takeoff distance available (TODA).

LANDING DISTANCE - LD

It is the distance necessary to land from a screen height of 50 ft above the landing surface and come to a complete stop.

The landing distance provided by CAFM for dry runway condition is the unfactored landing distance multiplied by a factor of 1.67.

The landing distance provided by CAFM for wet runway condition is the factored dry landing distance multiplied by a factor of 1.15.

TAKEOFF AND LANDING RUNWAY CONDITIONS

DRY RUNWAY

A runway is considered dry when it is clear of contaminants and visible moisture within the required length and width being used.

GROOVED OR POROUS RUNWAY SURFACES

Both are intended to improve airplane performance in wet runways by enhancing drainage capability. In grooved surfaces this is achieved through a specially prepared pavement with transverse wire comb texturing when the surface is in the plastic stage or with closely spaced transverse grooves. For porous surface drainage capability is enhanced by the use of voids on a specially treated wearing course (porous friction course).

WET RUNWAY

A runway is considered wet when it is neither dry nor contaminated.

CONTAMINATED RUNWAY - STANDING WATER

A runway is considered contaminated by standing water when covered by more than 3 mm deep water.

CONTAMINATED RUNWAY - SLUSH

A runway is considered contaminated by slush, when covered by partly melted snow or ice with high water content, such that it cannot significantly resist compression by hand, and of an assumed specific gravity of 0.85.

CONTAMINATED RUNWAY - COMPACTED SNOW

A runway is considered contaminated by compacted snow when covered by snow that has been compressed into a solid mass such the airplane wheels, at representative operating pressure and loadings, will run on the surface without causing significant rutting.

CONTAMINATED RUNWAY - DRY SNOW

A runway is considered contaminated by dry snow when covered by fresh snow with relatively little liquid water content, such that water cannot be squeezed out when compacted by hand, and with a specific gravity not greater than 0.2.

CONTAMINATED RUNWAY - WET SNOW

It is a snow that will stick together when compressed but will not readily allow water to flow from it when squeezed, with an assumed specific gravity of 0.5.

CONTAMINATED RUNWAY - DRY OR WET ICE

It is a runway surface condition where braking action is expected to be very low, due to the presence of wet ice.

TAKEOFF AND LANDING SPEEDS

MINIMUM CONTROL SPEED ON GROUND - V_{MCG}

Is the minimum speed on the ground at which, when the critical engine is suddenly made inoperative, it is possible to maintain control of the airplane with the remaining engine at takeoff thrust, with use of the primary aerodynamic controls alone, and not deviate more than 30 ft laterally from the centerline at any point during the takeoff run.

MINIMUM CONTROL SPEED IN THE AIR - V_{MCA}

It is the minimum speed at which, when the critical engine is suddenly made inoperative, it is possible to maintain control of the airplane with the remaining engine at takeoff thrust, and maintain a straight flight with an angle of bank of not more than 5°.

MINIMUM CONTROL SPEED DURING LANDING - V_{MCL}

During one engine inoperative approach or landing configuration, it is the minimum speed that is possible to maintain control of the airplane within defined limits while applying variations of power.

ENGINE FAILURE SPEED - V_{EF}

It is defined as the calibrated airspeed at which the critical engine is assumed to fail.

V_1 SPEED

It is the speed selected for each takeoff, based upon approved performance data and specified conditions, that is represented as follows:

- The maximum speed by which a rejected takeoff must be initiated to assure that a safe stop can be completed within the remaining runway, or runway and stopway or;
- The minimum speed that assures that a takeoff can be safely completed within the remaining runway, or runway and clearway, after failure of the most critical engine at a designated speed; and
- The single speed that permits a successful stop or continued takeoff when operating at the minimum allowable field length for a particular weight.

NOTE: - Safe completion of the takeoff includes both attainment of the designated screen height at the end of the runway or clearway, and safe obstacle clearance along the designated takeoff flight path.
- Reference performance conditions for determining V_1 may not necessarily account for all variables possibly affecting a takeoff, such as runway surface friction, failures other than a critical engine, etc.

BALANCED V_1

It is the V_1 speed that assures a balanced takeoff.

OPTIMUM V_1

It is the V_1 speed that assures the greatest V_1 dependent takeoff weight.

ROTATION SPEED - V_R

It is the speed at which the pilot starts to rotate the airplane during the takeoff ground run.

TAKEOFF SAFETY SPEED - V_2

It is the target speed to be attained at 35 ft height above runway surface, the critical engine having failed at V_{EF}.

MINIMUM UNSTICK SPEED - V_{MU}

It is the minimum speed at which the airplane can safely lift-off the ground, and continue takeoff without displaying any hazard to the airplane.

LIFT-OFF SPEED - V_{LOF}

It is the speed at which the airplane first becomes airborne during takeoff.

MAXIMUM TIRE SPEED

It is the maximum ground speed for which the tires are certified.

STALL SPEED - V_S

It is the minimum steady flight speed at which the airplane is controllable.

FLAP RETRACTION SPEED - V_{FR}

It is the speed at which the takeoff flaps retraction should be initiated during the acceleration segment in case of an engine failure takeoff.

FINAL SEGMENT SPEED - V_{FS}

It is the speed to be achieved at the end of the acceleration segment and start of the final segment of the takeoff flight path, with one engine inoperative, landing gear retracted, and flaps retracted.

APPROACH CLIMB SPEED

It is the go-around speed in the approach configuration, with one engine inoperative, approach flaps, and landing gear retracted.

LANDING CLIMB SPEED

It is the go-around speed in the landing configuration, with all engines operating, landing flaps, and landing gear extended.

LANDING REFERENCE SPEED - V_{REF}

It is the stabilized approach speed that is maintained down to the 50 ft height above the landing surface.

MAXIMUM BRAKE ENERGY SPEED - V_{MBE}

It is the highest speed from which the airplane may be brought to a stop without exceeding the maximum energy absorption capability of the brakes.

V_1/V_R RATIO

It is the ratio between V_1 and V_R. V_1 can never exceed V_R, therefore the maximum V_1/V_R is 1.00.

V_2/V_S RATIO

It is the ratio between V_2 and V_S. Regulations set a minimum value for this ratio, assuring safe airplane handling in climb after takeoff. For each flaps position, there is a certified V_2/V_S range.

FIXED V_2/V_S

It is a specific value for the V_2/V_S ratio defined to be considered in the calculation of the maximum takeoff weight.

OPTIMUM V_2/V_S

The optimum V_2/V_S is the ratio, within the certified range, that assures the best takeoff weight, based on the fact that the takeoff weights limited by field length, climb and obstacle clearance are directly affected by its value.

TAKEOFF PATH

The takeoff path assumes failure of one engine at V_{EF} and extends from a standing start to a point in takeoff at which the airplane is at least 1500 ft above takeoff surface and has achieved the enroute configuration and final segment climb speed. The CAFM determines the takeoff path up to 3000 ft AGL.

TAKEOFF FLIGHT PATH

The takeoff flight path starts at 35 ft above the takeoff surface, at the end of the one-engine-inoperative takeoff distance (TOD/OEI), and ends at 3000 ft AGL, for the CAFM. The takeoff flight path is divided into four segments related to distinct changes in configuration, power, and speed: first segment, second segment, acceleration segment, final segment. All segments are flown with the critical engine inoperative.

GROSS TAKEOFF FLIGHT PATH

It is the actual takeoff flight path.

NET TAKEOFF FLIGHT PATH

It is the actual takeoff flight path (gross path) reduced, at each takeoff segment, by a gradient of climb defined by the regulations.

LEVEL-OFF HEIGHT

It is the height or altitude where the airplane is leveled for acceleration and flap retraction, i.e. where the acceleration segment takes place. The gross level-off height is related to the gross takeoff flight path, while the net level-off height is related to the net takeoff flight path. The airplane acceleration in the net takeoff flight path is the actual gross airplane acceleration reduced by the acceleration decrement equivalent to the climb gradient reduction defined by the regulations.

MINIMUM LEVEL-OFF HEIGHT

It is defined by regulations as 400 ft AGL. The user can define higher levels.

MAXIMUM LEVEL-OFF HEIGHT

It is the height where the takeoff thrust time limit occurs at the end of the acceleration segment. The maximum level-off height cannot be lower than the minimum level-off height.

FIRST SEGMENT

Starts at 35 ft above the takeoff surface, at the end of the one-engine-inoperative takeoff distance (TOD/OEI), and extends to the point where the landing gear is fully retracted using a constant V_2 speed and takeoff flaps.

SECOND SEGMENT

Extends from the end of the first segment up to the level-off height, with takeoff flaps, gear up, and constant V_2 speed.

EXTENDED SECOND SEGMENT

It is an extension of the second takeoff climb segment, above the maximum level off height, to improve obstacle clearance performance.

THIRD (OR ACCELERATION) SEGMENT

Extends from the end of the second segment, at the level-off height, up to a point where the airplane is accelerated to final segment speed (V_{FS}) while retracting flaps.

FINAL SEGMENT

Extends from the end of the third segment to a gross height at least at 1500 ft AGL, with flaps up and at final segment speed (V_{FS}). The final segment ends at 3000 ft AGL for the CAFM.

WEIGHTS

REGULATED TAKEOFF WEIGHT - RTOW

It is the maximum allowed takeoff weight at the start of takeoff run, derived by complying with all requirements, such as those related to field length, climb gradients, brake energy, tire speed, obstacle clearance and structure.

TAKEOFF WEIGHT - TOW

It is the gross weight of the airplane at the start of takeoff run.

MAXIMUM TAKEOFF WEIGHT - MTOW

It is the maximum structural takeoff weight.

CLIMB LIMITED TAKEOFF WEIGHT (OR TAKEOFF WAT)

It is the maximum allowed takeoff weight for the airport altitude and temperature, and complying with the takeoff and go-around climb gradient requirements.

V_1 DEPENDENT TAKEOFF WEIGHT

It is the takeoff weight affected by V_1 selection. The V_1 dependent takeoff weights are those limited by field length (TOD/OEI, ASD/OEI, ASD/AEO), brake energy and obstacle clearance. The non-V_1 dependent takeoff weights are those limited by TOD/AEO, climb gradients, tire speed and structure.

LANDING WEIGHT - LW

It is the gross weight of the airplane at the landing screen height.

MAXIMUM LANDING WEIGHT - MLW

It is the maximum structural landing weight.

CLIMB LIMITED LANDING WEIGHT (OR LANDING WAT)

It is the maximum allowed landing weight for the airport altitude and temperature, and complying with the go-around climb gradient requirements, either for AEO or OEI conditions.

REGULATED LANDING WEIGHT - RLW

It is the maximum allowed landing weight, derived by complying with all requirements, such as those related to field length, climb gradients, brake energy, tire speed, and structure.

MINIMUM LANDING WEIGHT

It is the minimum allowed landing weight, derived by complying with steep approach requirements, based on the airplane approach glide capability.

ENGINE RATINGS

CRITICAL ENGINE

It is the engine whose failure would most adversely affect the performance or handling qualities of the airplane.

TAKEOFF THRUST

It is the maximum thrust available for takeoff, usually time limited.

NORMAL TAKEOFF THRUST - NTO

It is the maximum thrust available for the all-engine-operating takeoff, or for the one-engine-inoperative takeoff when ATTCS is not used. It is usually time limited.

AUTOMATIC TAKEOFF THRUST CONTROL SYSTEM - ATTCS

It is the system that increases the Normal Takeoff Thrust on the live engine to Reserved Takeoff Thrust, when the other engine fails. It is designed for saving engine life, since most of takeoffs do not suffer engine failure, thus allowing use of Normal Takeoff Thrust in every all-engine-operating takeoff. ATTCS is also used to increase the Normal Go-Around Thrust on the live engine to Maximum Go-Around Thrust, when the other engine fails.

DERATED TAKEOFF THRUST

It is a takeoff thrust level less than the maximum takeoff thrust, which is considered by the CAFM as an independent and clearly distinguished takeoff thrust rating that complies with all takeoff performance requirements. When operating with derated takeoff thrust, the takeoff thrust setting parameter that is presented by the CAFM is considered a normal takeoff operating limit. It is usually time limited.

REDUCED TAKEOFF THRUST

It is a takeoff thrust level less than the maximum takeoff thrust, or less than the derated takeoff thrust. When operating with reduced takeoff thrust, the takeoff thrust setting parameter that is presented by the CAFM is not considered a takeoff operating limit. It is usually time limited.

GO-AROUND THRUST

It is the maximum thrust available for go-around, usually time limited.

NORMAL GO-AROUND THRUST

It is the maximum thrust available for the all-engine-operating go-around, or for the one-engine-inoperative go-around when ATTCS is not used. It is usually time limited.

MAXIMUM CONTINUOUS THRUST

It is the maximum thrust that may be used continuously, not time limited.

MAXIMUM CLIMB THRUST

It is the maximum thrust available for use during climb to cruise flight level, step climb, or for acceleration to cruise speed, with all engines operating, not time limited.

MAXIMUM CRUISE THRUST

It is the maximum thrust available for cruise with all engines operating, not time limited.

IDLE THRUST

It is rather a thrust lever position suitable for a minimum thrust operation. This may be a thrust idle mode for ground operation (ground idle), a thrust idle mode for normal flight (flight idle), and a thrust idle mode for landing approach (approach idle).

ENROUTE AND TURN PERFORMANCE

CLIMB OR DESCENT GRADIENT

It is the tangent of the angle of climb or descent flight path, in relation to the horizontal plane, usually expressed as percentage. Climb gradients are positive while descent gradients are negative.

DRIFTDOWN

It is the descent flight path following an engine failure, when the airplane is not able to maintain cruise altitude.

CEILING

It is the maximum altitude at which straight and level flight is possible.

BUFFET

It is the vibration felt by the pilot caused by boundary layer detachment due to high angles of attack or shock waves.

LOAD FACTOR

It is the ratio between the aerodynamic force component acting normal to the longitudinal axis of the airplane and the airplane weight. A positive load factor is one in which the aerodynamic force acts upward with respect to the airplane.

BANK ANGLE

It is the airplane lateral inclination of the wings, in relation to the horizontal plane.

PERFORMANCE INFORMATION

INPUT DATA ADJUSTMENT TO ENVELOPE

Input data outside the airplane operational envelope is usually adjusted by the CAFM. This is particularly frequent for input temperatures, but can also occur for input altitudes and speeds. A message indicating that input values have been adjusted to the AFM limits will be shown in the “Messages” tab.

BALANCED V_1 VERSUS OPTIMUM V_1

Optimum V_1 assures the greatest takeoff weight among the V_1 dependent weights. Balanced V_1 can lead to the same takeoff weights as the optimum V_1, but not always, depending on the field lengths available (TORA, TODA, ASDA), and on limitations such as brake energy, obstacle clearance, V_1 range restrictions, etc.

When balanced V_1 is requested and a balanced takeoff cannot be calculated, CAFM resumes calculation considering the optimum V_1.

The balanced V_1 is always presented as the optimum V_1, and one must compare TOD/OEI to ASD to check whether they are equal or not, in order to assure that a balanced takeoff occurs.

V_2/V_S INPUT ADJUSTMENT

V_2/V_S input data outside the airplane approved range is adjusted by the CAFM. A message indicating that input values have been adjusted to the AFM limits will be shown in the “Messages” tab.

The input and range V_2/V_S values are “label” values in the sense that they usually occur in the low thrust to weight ratio region, where the airplane is at or close to the climb limiting condition. At high thrust to weight ratio regions the airplane has better accelerating capabilities, which leads to higher speeds achieved at the takeoff screen height, thus increasing the output V_2/V_S to numbers above the original “label” input.

LEVEL-OFF HEIGHT

CAFM allows selection of fixed level-off height, maximum level-off height only, minimum level-off height only, or both maximum and minimum level-off heights.

The minimum or the fixed level-off height cannot be lower than 400 ft AGL, but the user can define higher figures. The maximum level-off height will never be lower than the minimum level-off height.

The fixed level-off height is not changed during flight path calculation. Therefore, for airport analysis mode, airplane weight will be reduced as required for obstacle clearance with fixed level-off height. On the other hand, maximum and minimum level-off heights are adjusted for optimizing obstacle clearance analysis, except that the user defined minimum level-off height prevails as a minimum that cannot be reduced.

When both maximum and minimum level-off heights are available, any level-off height in between them can be scheduled for flight.

APPROACH FLAP SELECTION FOR TAKEOFF ANALYSIS

The approach flap selected for takeoff runway analysis is used to compute the climb limited takeoff weight due to the minimum climb gradient required for go-around at the same airport. There is four climb limited weights (or WAT limitations) for takeoff, so called: first segment WAT; second segment WAT, final segment WAT, and approach climb WAT.

Since the approach flap is tied to the landing flap, one must consider the landing flap selected for landing at the same airport in case an emergency occurs and an immediate landing is required after takeoff. The selected landing flap will dictate the approach flap for takeoff analysis.

REVERSE THRUST PERFORMANCE CREDIT

Reverse thrust performance credit can be granted according to operational regulations. Usually, reverse thrust credit can be taken for:

- Takeoff field length performance: wet and contaminated runways;
- Landing field length performance: contaminated runway.

Regulations also require that the reverse thrust system reliability be demonstrated to a certain degree. Lack of this demonstration will preclude calculation of reverse thrust performance.

TAKEOFF MAXIMUM STOPPING MARGIN

The use of minimum V_1 has long been understood to be a valuable aid in the prevention of rejected takeoff (RTO) overrun accidents. The minimum V_1 provided by the CAFM will be the lowest V_1 for the RTOW. As such, it will provide the greatest margin between the accelerate-stop distance available and the accelerate-stop distance required. For airplanes with relatively low ground minimum control speeds, the lowest permissible V_1 may be as such as 40 kt below the rotation speed, V_R. This puts the pilot into a position of having to continue a takeoff following an engine failure at a very low speed.

The input parameters provided in boxes “Maximum stopping margin” and “Maximum difference between V_1 and V_R” are intended to allow the airline user to take advantage of the benefits provided by the use of minimum V_1 while at the same time reducing the exposure time between V_1 and V_R to suit his needs.

As actual takeoff weight is reduced below the field length limited weight (FLLW) there is a range of V_1 speeds defined by V_1 MIN and V_1 MAX. The greatest stopping margin is provided when V_1 = V_1 MIN. At relatively low actual takeoff weights the stopping margin provided by V_1 MIN may be much greater than the required to provide reasonable protection for an RTO overrun. There is a corresponding large exposure time between V_1 and V_R where a takeoff would have to be continued following an engine failure.

Maximum difference between V_1 and V_R ($\triangle$V) allows the user to limit the calculation of V_1 MIN as follows: as actual takeoff weight is reduced below the FLLW the calculation of V_1 MIN proceeds normally; at the point where V_1 MIN is equal to $V_R - \triangle V$, then the calculation of V_1 MIN is governed by the specified speed difference.

Maximum stopping margin allows the user to limit the calculation of V_1 MIN as follows: as actual takeoff weight is reduced below the FLLW, the calculation of V_1 MIN proceeds normally; at the point where the specified stopping margin is reached, the calculation of V_1 MIN is governed by the stopping margin, i.e., V_1 MIN is increased in order to keep the stopping margin. V_1 MIN will not be allowed to be greater than V_1 MAX (V_R or V_{MBE}).

TAKEOFF FIELD LENGTH - WET AND CONTAMINATED RUNWAY

When “Airport Analysis” calculation type is selected, the wet or contaminated runway takeoff performance is compared to the dry runway takeoff performance, and the lesser takeoff weight is taken as the maximum field length limited takeoff weight.

When “Given Weight” calculation type is selected, the wet or contaminated runway takeoff performance is not compared to the dry runway takeoff performance. The resulting distances refer exclusively to the requested wet or contaminated runway takeoff performance.

TAKEOFF FROM GROOVED OR PFC RUNWAY

Airplane operators who wish to use the grooved or PFC runway accelerate-stop distances must determine that the design, construction, and maintenance aspects are acceptable for each runway for which such credit is sought.
The airplane operator must coordinate with each Airport Authority in order that appropriate standards are complied with.

GRADIENT LOSS IN TURN

Gradient loss in turn after takeoff is supplied by the CAFM, either for V_2 with takeoff flaps or for V_{FS} with flaps up.

Landing gear may be retracted or extended, and thrust may be Takeoff Thrust or Maximum Continuous Thrust, with all engines operating (AEO) or one engine inoperative (OEI).

The speed is incremented as following:

Bank Angle	Takeoff Flaps	Flaps Retracted
from 0° to 15°	V_2	V_{FS}
from 15° up to 20°	V_2 + 5 KIAS	V_{FS} + 5 KIAS
from 20° up to 25°	V_2 + 10 KIAS	V_{FS} + 10 KIAS

Once bank angle is known, the speed is set according to table above and the climb gradients are calculated for both wings level and the specified bank angle. The gradient loss is the difference between both. Notice that for wings level the climb gradient is calculated also at the incremented speed, as applicable, not at the original V_2 or V_{FS}.

ATTCS FOR GO-AROUND

ATTCS selection is not available for Go-Around, both in the Landing module and in the Takeoff module. CAFM assumes ATTCS always set to ON for Go-Around, due to airplane system design characteristics.

AIR CONDITIONING SYSTEM FOR GO-AROUND

Air Conditioning selection is not available for Go-Around, both in the Landing module and in the Takeoff module. CAFM assumes Air Conditioning for Go-Around set as:

- Go-Around AEO: Air Conditioning for Go-Around is always set to ON.
- Go-Around OEI, climb gradient and WAT calculations: Air Conditioning is set to ON for airport pressure altitude greater than 9700 ft, otherwise is set to OFF.
- Go-Around OEI, V_{MCL} calculation: Air Conditioning is always set to OFF.

V_{REF} OVERSPEED

The landing module of the CAFM allows for the calculation of landing performance with an increased landing reference speed (V_{REF} OVERSPEED), with the airplane in normal conditions.

The effect of the overspeed required by AFM procedures for landing in emergency or abnormal configurations has been already taken into account in the landing distance factors therein presented. Therefore, the CAFM V_{REF} OVERSPEED feature is not to be used for calculation of the landing performance for the AFM emergency or abnormal cases, due to the different airplane configurations involved.

DEMONSTRATED CROSSWIND

The maximum demonstrated crosswind component for takeoff and landing is 28 kt. This maximum demonstrated value is not considered to be limiting.

INTENTIONALLY BLANK

NOISE LEVELS

The following Effective Perceived Noise Levels (EPNL's) comply with, FAA Part 36, Appendix A and B, Stage 3 noise limits and were obtained by analysis of approved data from noise tests conducted under the provisions of ICAO Annex 16, Volume 1 - Chapter 3 and FAA Part 36.

If the airplane is equipped with at least one of the following components, the noise levels table below must be used:

- Inlet Assembly P/N 15C0003301.
- Inlet Assembly P/N 15C0003005.
- Thrust Reverser LH assemblies P/N 15G0002-011.
- Thrust Reverser RH assemblies P/N 15G0003-011.
- Thrust Reverser LH assemblies P/N 15G0002-012.
- Thrust Reverser RH assemblies P/N 15G0003-012.

NOISE LEVEL IN EPNdB			
Airplane Model	**CONDITION**		
	Flyover	**Lateral**	**Approach**
EMBRAER 170 STD	83.0	92.3	94.9
EMBRAER 170 LR	84.1	92.3	94.9
EMBRAER 170 SU	84.1	92.3	94.9
EMBRAER 170 SE	84.1	92.3	94.9

For all other airplanes, the noise levels table is the following:

NOISE LEVEL IN EPNdB			
Airplane Model	**CONDITION**		
	Flyover	**Lateral**	**Approach**
EMBRAER 170 STD (1)	82.2	92.1	94.9
EMBRAER 170 LR (1)	83.2	92.0	94.9
EMBRAER 170 SU	83.2	92.0	94.9
EMBRAER 170 SE	83.2	92.0	94.9

NOTE: (1) For airplanes Post-Mod. SB 170-00-0003 or with an equivalent modification factory incorporated, the noise levels remain the same.

The noise levels for EMBRAER 170 equipped with APU Hamilton Sundstrand APS 2300 and two GE CF34-8E5 engines were established as follows:

- Flyover: at maximum takeoff weight, flap setting 1 and thrust power cutback;
- Lateral: at maximum takeoff weight, flap setting 1 and with all engines at maximum takeoff power setting;
- Approach: at maximum landing weight, 3° glide slope, V_{REF} + 10 KIAS and flap setting FULL.

No determination has been made by the Federal Aviation Administration that the noise levels in this aircraft are or should be acceptable or unacceptable for operation at, into, or out of any airport.

AIRPLANES WITH THE “SILENT KIT” PLACARD INSTALLED (P/N 171-15317-001)

The following noise levels comply with part 36, Appendix B, Stage 4 maximum noise level requirements and were obtained by analysis of approved data from noise tests conducted under the provisions of part 36, Amendment 36-28. The noise measurement and evaluation procedures used to obtain these noise levels are considered by the FAA to be equivalent to the Chapter 4 noise level required by the International Civil Aviation Organization (ICAO) in Annex 16, Volume I, Appendix 2, Amendment 7, effective March 21, 2002.

NOISE LEVEL IN EPNdB			
Airplane Model	**CONDITION**		
	Flyover	**Lateral**	**Approach**
EMBRAER 170 STD (1)	80.8	90.6	95.1
EMBRAER 170 LR (1)	81.9	90.6	95.1
EMBRAER 170 SU	81.9	90.6	95.1
EMBRAER 170 SE	81.9	90.6	95.1

NOTE: (1) For airplanes Post-Mod. SB 170-00-0003 or with an equivalent modification factory incorporated, the noise levels remain the same.

The noise levels for EMBRAER 170 equipped with APU Hamilton Sundstrand APS 2300 and two GE CF34-8E5 engines were established as follows:

- Flyover: at maximum takeoff weight, flap setting 1 and thrust power cutback;
- Lateral: at maximum takeoff weight, flap setting 1 and with all engines at maximum takeoff power setting;
- Approach: at maximum landing weight, 3° glide slope, V_{REF} + 10 KIAS and flap setting FULL.

No determination has been made by the Federal Aviation Administration that the noise levels of this aircraft are or should be acceptable or unacceptable for operation at, into, or out of any airport.

INTENTIONALLY BLANK

NOISE LEVELS

The following Effective Perceived Noise Levels (EPNL's) comply with, FAA Part 36, Appendix C, Stage 3 noise limits and were obtained by analysis of approved data from noise tests conducted under the provisions of ICAO Annex 16, Volume 1 - Chapter 3 and FAA Part 36.

NOISE LEVEL IN EPNdB			
Airplane Model	**CONDITION**		
	Flyover	**Lateral**	**Approach**
EMBRAER 175 STD	83.3	92.1	95.0
EMBRAER 175 LR	84.4	91.9	95.0
EMBRAER 175 SU	84.4	91.9	95.0

The noise levels for EMBRAER 175 equipped with APU Hamilton Sundstrand APS 2300 and two GE CF34-8E5 engines were established as follows:

- Flyover: at maximum takeoff weight, flap setting 1 and thrust power cutback;
- Lateral: at maximum takeoff weight, flap setting 1 and with all engines at maximum takeoff power setting;
- Approach: at maximum landing weight, 3° glide slope, V_{REF} + 10 KIAS and flap setting FULL.

No determination has been made by the Federal Aviation Administration that the noise levels of this aircraft are or should be acceptable or unacceptable for operation at, into, or out of any airport.

AIRPLANES WITH THE "SILENT KIT" PLACARD INSTALLED (P/N 171-15317-001)

The following noise levels comply with part 36, Appendix B, Stage 4 maximum noise level requirements and were obtained by analysis of approved data from noise tests conducted under the provisions of part 36, Amendment 36-28. The noise measurement and evaluation procedures used to obtain these noise levels are considered by the FAA to be equivalent to the Chapter 4 noise level required by the International Civil Aviation Organization (ICAO) in Annex 16, Volume I, Appendix 2, Amendment 7, effective March 21, 2002.

NOISE LEVEL IN EPNdB			
Airplane Model	**CONDITION**		
	Flyover	**Lateral**	**Approach**
EMBRAER 175 STD	82.1	90.6	95.2
EMBRAER 175 LR	83.3	90.5	95.2
EMBRAER 175 SU	83.3	90.5	95.2

The noise levels for EMBRAER 175 equipped with APU Hamilton Sundstrand APS 2300 and two GE CF34-8E5 engines were established as follows:

- Flyover: at maximum takeoff weight, flap setting 1 and thrust power cutback;
- Lateral: at maximum takeoff weight, flap setting 1 and with all engines at maximum takeoff power setting;
- Approach: at maximum landing weight, 3° glide slope, V_{REF} + 10 KIAS and flap setting FULL.

No determination has been made by the Federal Aviation Administration that the noise levels of this aircraft are or should be acceptable or unacceptable for operation at, into, or out of any airport.

NOISE LEVELS

The following Effective Perceived Noise Levels (EPNL's) comply with, FAA Part 36, Appendix C, Stage 3 noise limits and were obtained by analysis of approved data from noise tests conducted under the provisions of ICAO Annex 16, Volume 1 - Chapter 3 and FAA Part 36.

NOISE LEVEL IN EPNdB			
Airplane Model	**CONDITION**		
	Flyover	**Lateral**	**Approach**
EMBRAER 175 STD (1) **EMBRAER 175 SU (1)** **EMBRAER 175 LR (1)**	85.9	91.9	95.0

NOTE: (1) For airplanes Post-Mod. SB 170-00-0016 or equipped with an equivalent modification factory incorporated.

The noise levels for EMBRAER 175 equipped with APU Hamilton Sundstrand APS 2300 and two GE CF34-8E5, were established as follows:

– Flyover: at maximum takeoff weight, flap setting 1 and thrust power cutback;
– Lateral: at maximum takeoff weight, flap setting 1 and with all engines at maximum takeoff power setting;
– Approach: at maximum landing weight, 3° glide slope, V_{REF} + 10 KIAS and flap setting FULL.

No determination has been made by the Federal Aviation Administration that the noise levels of this aircraft are or should be acceptable or unacceptable for operation at, into, or out of any airport.

AIRPLANES WITH THE “SILENT KIT” PLACARD INSTALLED (P/N 171-15317-001)

The following noise levels comply with part 36, Appendix B, Stage 4 maximum noise level requirements and were obtained by analysis of approved data from noise tests conducted under the provisions of part 36, Amendment 36-28. The noise measurement and evaluation procedures used to obtain these noise levels are considered by the FAA to be equivalent to the Chapter 4 noise level required by the International Civil Aviation Organization (ICAO) in Annex 16, Volume I, Appendix 2, Amendment 7, effective March 21, 2002.

NOISE LEVEL IN EPNdB			
Airplane Model	**CONDITION**		
	Flyover	**Lateral**	**Approach**
EMBRAER 175 STD (1) **EMBRAER 175 SU (1)** **EMBRAER 175 LR (1)**	84.7	90.4	95.2

NOTE: (1) For airplanes Post-Mod. SB 170-00-0016 or equipped with an equivalent modification factory incorporated.

The noise levels for EMBRAER 175 equipped with APU Hamilton Sundstrand APS 2300 and two GE CF34-8E5 engines were established as follows:

- Flyover: at maximum takeoff weight, flap setting 1 and thrust power cutback;
- Lateral: at maximum takeoff weight, flap setting 1 and with all engines at maximum takeoff power setting;
- Approach: at maximum landing weight, 3° glide slope, V_{REF} + 10 KIAS and flap setting FULL.

No determination has been made by the Federal Aviation Administration that the noise levels of this aircraft are or should be acceptable or unacceptable for operation at, into, or out of any airport.

POSITION ERROR CORRECTIONS

The corrections to be applied to indicated airspeed or altitude in order to eliminate the effect of location of the static port on instrument readings are shown in the Airspeed Position Error Correction charts and in the Altitude Position Error Correction charts. No position error correction is required for ADSP 1 and ADSP 2 and they are only applicable for ADSP 3 according to the following conditions:

- Airspeed Position Error Correction for flaps 0,1, 2, 3, 4, 5 and full.
- Altitude Position Error Correction for flaps 0, 1, 2, 3, 4, 5 and full.

AIRSPEED POSITION ERROR CORRECTION CHART

USE

Enter the chart with indicated airspeed, considering the appropriate configuration, to read airspeed correction. The calibrated airspeed will be the sum of the indicated airspeed and airspeed correction.

EXAMPLE

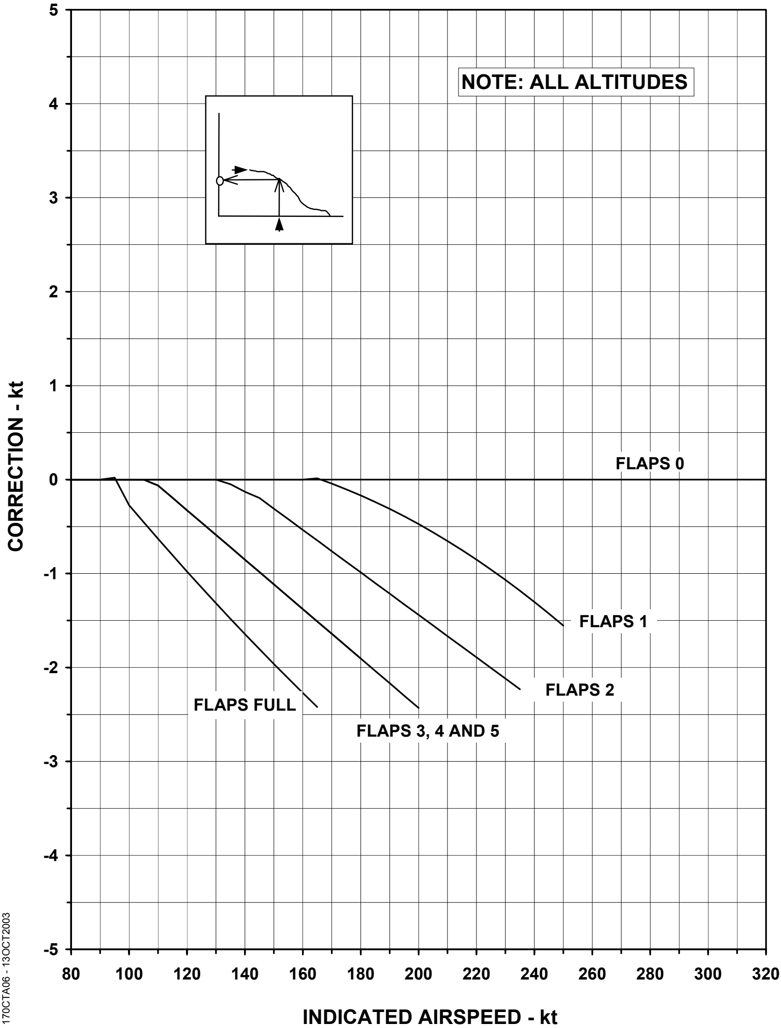
Given:

ADSP 3
Indicated Airspeed.. 150 KIAS
Flaps.. Full

Determine:

Airspeed correction .... -2.0
Calibrated Airspeed.. 148 KCAS

AIRSPEED POSITION ERROR CORRECTION
AIR DATA SYSTEM 3
FLAPS 0, 1, 2, 3, 4, 5 AND FULL



ALTITUDE POSITION ERROR CORRECTION CHART

USE

Enter the appropriate chart with indicated airspeed, the indicated pressure altitude considering the appropriate airplane configuration to read the altimetric correction. The true pressure altitude will be the indicated pressure altitude minus the altimetric correction.

EXAMPLE

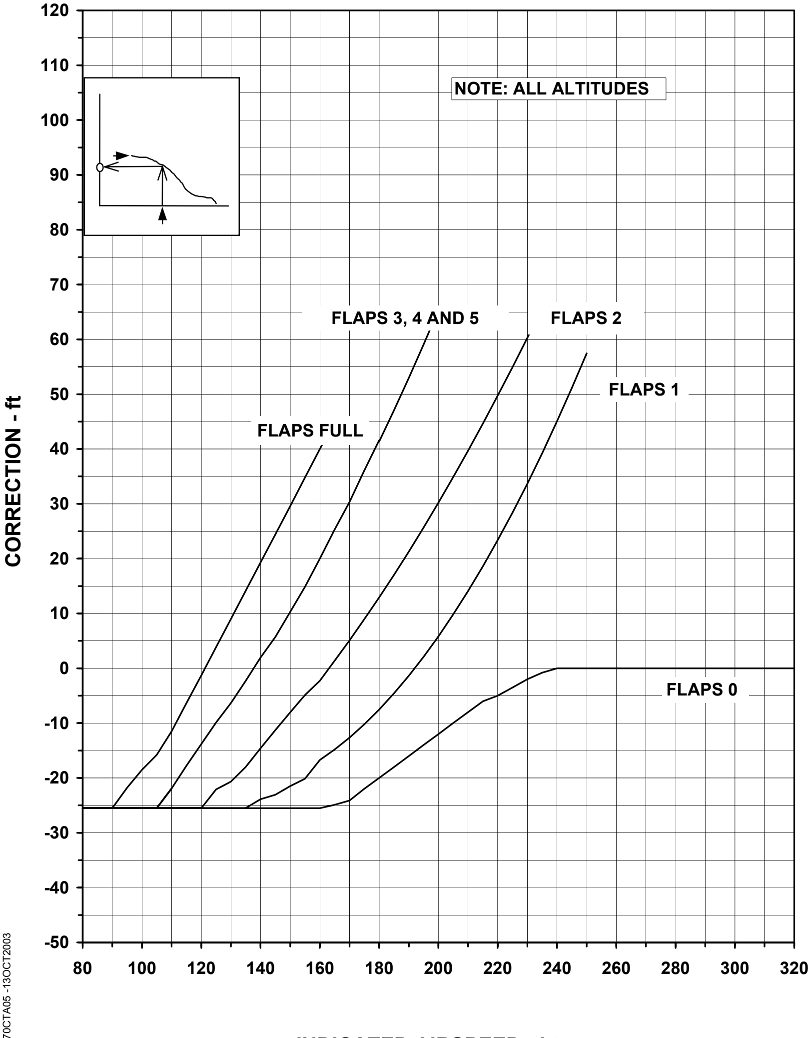
Given:

ADSP 3
Indicated Airspeed .... 200 KIAS
Flaps 2
Altitude... 3000 ft

Determine:

Altimetric correction .... 30 ft
True Pressure Altitude... 2970 ft

ALTITUDE POSITION ERROR CORRECTION
AIR DATA SYSTEM 3
FLAPS 0,1, 2, 3, 4, 5 AND FULL



SUPPLEMENTS

TABLE OF CONTENTS

13 NOT APPLICABLE

SUPPLEMENT 1

COMPUTERIZED AIRPLANE FLIGHT MANUAL

TABLE OF CONTENTS

INTRODUCTION

This Supplement presents the Computerized Airplane Flight Manual CAFM - for EMBRAER 170 and EMBRAER 175 performance calculation.

SOFTWARE PRESENTATION

The Computerized Airplane Flight Manual - CAFM performance calculation software has been developed employing a modular concept and in a manner that allows the user to run only the specific configuration applicable to his/her airplane.

Among the many modules that compose the software, three kinds are worth emphasizing:

- The Main Computer Interface - it is an user friendly calling program that makes possible to input data and to obtain outputs from the calculation.
- The Calculation Module - the core of the software, which obtains the inputs from the Calling Program and performs the required calculations.
- The Database - a set of files read by the Calculation Module, to obtain engine and airplane data.

Each one of the modules above is approved by the Certification Authority and bears a dedicated part number. When using the software, a cross-reference with the list of approved versions in the Limitations Section of this Supplement must be made.

The CAFM version is composed of two numbers. If there is an update only to the databases, the second number only moves on (e.g: Version 3.2 evolves to Version 3.3). When the CAFM is revised with changes on the Main Computer Interface or Calculation Modules the version moves on (e.g: Version 3.2 evolves to Version 4.0).

Although the user interface is very friendly, a dedicated User's Guide is also issued, as a separate document, providing detailed information on software usage. In addition, the Main Computer Interface provides a Help feature with useful on line information.

INTENTIONALLY BLANK

LIMITATIONS

CAFM-170-FAA-002

CAFM-170-FAA-002 is constituted by specific Software Module part numbers and Engine Database to allow performance calculations for airplanes with the following configuration:

– EMBRAER 170 airplanes.

– CF34-8E5 Engines.

WARNING:

- **CAFM VERSION MUST BE IN ACCORDANCE WITH AIRPLANE CONFIGURATION.**
- **VERSIONS NOT PRESENTED IN THIS SUPPLEMENT ARE AUTOMATICALLY CANCELLED AND MUST NOT BE USED.**
- **THE CAFM CG ENVELOPE OPTION MUST ALWAYS BE SET TO STANDARD, UNLESS OTHERWISE STATED IN THE AFM LIMITATIONS SECTION.**
- **AIRPLANES POST-MOD. SB 170-36-0008 (FIXED SCOOP) OR EQUIPPED WITH AN EQUIVALENT MODIFICATION FACTORY INCORPORATED MUST SELECT CF34-8E5-SCOOP ENGINE MODEL OPTION IN THE AIRPLANE DATA FIELD.**
- **AIRPLANES PRE-MOD. SB 170-31-0019 (LOAD 19.3) MUST SELECT FIXED V_2/V_S OPTION AND MUST USE THE FOLLOWING VALUES:**

FLAPS POSITION	1	2	4
FIXED V_2/V_S	1.20	1.20	1.19

CONTINUES ON NEXT PAGE

CONTINUED FROM PREVIOUS PAGE

VERSION 11.0

Version Features:

- Updates CAFM calculation modules, affecting takeoff performance software output.
- Removes all the “Best of” options from the Flight path analysis option field in the CAFM takeoff interface.
- Removes the "Maximum stopping margin" option from the CAFM takeoff interface.
- Disables the combination of fixed level-off value with “Extended 2nd segment” in the CAFM takeoff interface.

NOTE: - This CAFM installer incorporates the media identification (i.e. CAFM-170-FAA-002 version 11.0), which will be displayed on the screen after installation and must be crosschecked with the AFM.

- This version incorporates all capabilities of the previous versions.

LIMITATIONS

CAFM-175-FAA-002

CAFM-175-FAA-002 is constituted by specific Software Module part numbers and Engine Database to allow performance calculations for airplanes with the following configuration:

- EMBRAER 175 airplanes.
- CF34-8E5 Engines.

WARNING:

- **CAFM VERSION MUST BE IN ACCORDANCE WITH AIRPLANE CONFIGURATION.**
- **VERSIONS NOT PRESENTED IN THIS SUPPLEMENT ARE AUTOMATICALLY CANCELLED AND MUST NOT BE USED.**
- **THE CAFM CG ENVELOPE OPTION MUST ALWAYS BE SET TO STANDARD, UNLESS OTHERWISE STATED IN THE AFM LIMITATIONS SECTION.**
- **AIRPLANES POST-MOD. SB 170-36-0008 (FIXED SCOOP) OR EQUIPPED WITH AN EQUIVALENT MODIFICATION FACTORY INCORPORATED MUST SELECT CF34-8E5-SCOOP ENGINE MODEL OPTION IN THE AIRPLANE DATA FIELD.**
- **AIRPLANES PRE-MOD. SB 170-31-0019 (LOAD 19.3) MUST SELECT FIXED V_2/V_S OPTION AND MUST USE THE FOLLOWING VALUES.**

FLAPS POSITION	1	2	4
FIXED V_2/V_S	1.20	1.17 to 1.21	1.19

CONTINUES ON NEXT PAGE

CONTINUED FROM PREVIOUS PAGE

VERSION 7.0

Version Features:

- Updates CAFM calculation modules, affecting takeoff performance software output.
- Removes all the “Best of” options from the Flight path analysis option field in the CAFM takeoff interface.
- Removes the "Maximum stopping margin" option from the CAFM takeoff interface.
- Disables the combination of fixed level-off value with “Extended 2nd segment” in the CAFM takeoff interface.

NOTE: - This CAFM installer incorporates the media identification (i.e. CAFM-175-FAA-002 version 7.0), which will be displayed on the screen after installation and must be crosschecked with the AFM.

- This version incorporates all capabilities of the previous versions.

LIMITATIONS

CAFM-175-FAA-006

CAFM-175-FAA-006 is constituted by specific Software Module part numbers and Engine Database to allow performance calculations for airplanes with the following configuration:

- EMBRAER 175 airplanes Post-Mod. SB 170-57-0058 or with an equivalent factory modification (Enhanced Wing Tip).
- CF34-8E5 Engines.

WARNING:

- **CAFM VERSION MUST BE IN ACCORDANCE WITH AIRPLANE CONFIGURATION.**
- **VERSIONS NOT PRESENTED IN THIS SUPPLEMENT ARE AUTOMATICALLY CANCELLED AND MUST NOT BE USED.**
- **THE CAFM CG ENVELOPE OPTION MUST ALWAYS BE SET TO STANDARD, UNLESS OTHERWISE STATED IN THE AFM LIMITATIONS SECTION.**
- **AIRPLANES POST-MOD. SB 170-36-0008 (FIXED SCOOP) OR EQUIPPED WITH AN EQUIVALENT MODIFICATION FACTORY INCORPORATED MUST SELECT CF34-8E5-SCOOP ENGINE MODEL OPTION IN THE AIRPLANE DATA FIELD.**

CONTINUES ON NEXT PAGE

CONTINUED FROM PREVIOUS PAGE

VERSION 7.1

Version Features:

– Includes improved climb performance for EMBRAER 175 with Enhanced Wing Tip.

NOTE: - This CAFM installer incorporates the media identification (i.e. CAFM-175-FAA-006 version 7.1), which will be displayed on the screen after installation and must be crosschecked with the AFM.

- This version incorporates all capabilities of the previous versions.

NORMAL PROCEDURES

Normal procedures presented in the basic AFM remain unchanged.

EMERGENCY AND ABNORMAL PROCEDURES

Emergency and abnormal procedures presented in the basic AFM remain unchanged.

THIS PAGE INTENTIONALLY LEFT BLANK

PERFORMANCE

The data obtained from the software is calculated considering the basic performance configurations presented in Section 5 - Performance, and the procedures presented in Section 3 - Normal Procedures and Section 4 - Emergency and Abnormal Procedures.

ENGINE DATA

The CAFM calculates the engine power readings used to obtain the installed engine power on which the airplane's certified performance is based on.

TAKEOFF

All takeoff data required for a safe operation is obtained from the CAFM.

ENROUTE

All enroute data required for a safe operation is obtained from the CAFM.

APPROACH AND LANDING

Approach and landing data are obtained from the CAFM.

QUICK TURN AROUND WEIGHT

Quick turn around weight is obtained from the CAFM.

INTENTIONALLY BLANK

SUPPLEMENT 4

PRIMUS EPIC - FLIGHT MANAGEMENT SYSTEM

TABLE OF CONTENTS

GENERAL (LOAD PRIOR TO 27.1)

NOTE: All pages from code 01 of this supplement are applicable to airplanes equipped with Load prior to 27.1.

INTRODUCTION

This Supplement is a part of, and must be placed in, the FAA Approved Airplane Flight Manual for airplanes incorporating the Honeywell Primus Epic Flight Management System (FMS). The information contained herein supplements the information of the basic AFM. For limitations, procedures and performance information not contained in this Supplement, refer to the basic AFM.

NAVIGATION OPERATIONAL APPROVALS

Honeywell Primus Epic FMS installation has been shown to meet the requirements for the following operations:

- **Required Navigation Performance (RNP) Operations**
  - The FMS has been demonstrated compliant with the requirements of RTCA DO-283 - Minimum Operational Performance Specification for Required Navigation Performance, including the capability to fly precision arc (RF) legs.
  - The FMS has been demonstrated to provide a minimum RNP level of RNP 0.3 NM when operated according to the limitations and procedures described in this supplement.
  - The airplane meets the performance and functional requirements of FAA AC 90-101 for RNP AR approach operations requiring RNP not less than 0.30 for approach and not less than 1.0 for missed approach, when equipped with the Honeywell Primus Epic FMS and when operated in compliance with the recommended Embraer flight crew and operational procedures.
  - The temperature compensation function complies with RTCA/DO-236B, Appendix H.2.

NOTE: Appropriate operational approval must be obtained prior to conducting specified RNP AR instrument approach procedures.

Refer to the PERFORMANCE section of this supplement for more details regarding RNP operations.

NOTE: The airplane capability does not constitute RNP operation approval. The operators must be granted local approval to conduct RNP operations.

- **Navigation using GPS –** The FMS has been demonstrated compliant with the requirements of FAA AC90-94, regarding the use of GPS for IFR navigation in en-route, terminal, and non-precision approach operations.

- **Navigation using IRS –** The FMS has been demonstrated compliant with the requirements of AC25-4, AC121-13, and FAR 121, Appendix G, regarding the use of IRS as a long range navigation system. Pilot qualification is required to comply with operation under AC121-13.

- **Remote/Oceanic Operation** – The FMS has been demonstrated compliant with the requirements of AC 20-130A, regarding multi-sensor system operation in remote/oceanic flight, when operated as a dual system, with dual installed FMS, GPS, and IRS operational prior to the start of flight.
  The FMS has been demonstrated compliant with the requirements of AC121-13 and FAR121, Appendix G, regarding use of IRS as a primary means of navigation in remote/oceanic flight, with dual installed FMS and IRS operational prior to the start of flight.

  The FMS has been demonstrated compliant with the requirements of FAA Notice 8110.60, regarding use of GPS as a primary means of navigation in remote/oceanic flight, with dual installed FMS and GPS operational prior to the start of flight.

- **North Atlantic Minimum Navigation Performance Specification (NAT-MNPS) Airspace** – The FMS has been demonstrated compliant with the requirements of AC120-33 when operated as a dual system, with dual installed FMS, GPS, and IRS operational prior to the start of flight.

- **RNP 10 Airspace** – The FMS has been demonstrated compliant with the requirements of FAA Order 8400.12A when operated as a dual system, with dual installed FMS, GPS, and IRS operational prior to the start of flight.

  NOTE: The term RNP 10 must be understood as RNAV 10 as per ICAO nomenclature.

- **Enroute and Terminal Operation** – The FMS has been demonstrated compliant with the requirements of AC 20-130A and AC25-15, regarding multi-sensor system IFR operation in en-route/terminal flight, with at least a single PFD, MFD, FMS, VOR, DME, and IRS in NAV mode operational prior to the start of flight.

- **Approach Operation** – The FMS has been demonstrated compliant with the requirements of AC 20-130A and AC25-15, regarding multi-sensor system instrument non-precision approach operation. The FMS has been demonstrated compliant with AC90-94, regarding the use of GPS for non-precision approaches. The FMS must be operated as at least a single system, with a minimum of one PFD, MFD, and FMS operational prior to commencing the approach. The signal source(s) used to define the approach and on-board equipment must be verified operational prior to commencing the approach, as explained in the LIMITATIONS section of this supplement. The FMS supports the following non-precision approach types:
  - GPS only (type III FAA overlay definition);
  - RNAV (including type II or type III FAA overlay definition);
  - VOR;
  - VOR-DME;
  - NDB;
  - NDB-DME.

  NOTE: VOR and NDB based approaches include FAA type II GPS overlays. AC 90-94 deals with the use of GPS in the US National Airspace System (NAS). The general approval to use GPS to fly overlay instrument approaches as described in the AC, is initially limited to the NAS. Refer to LIMITATIONS Section of this Supplement, for use of GPS for non-precision approaches outside the US NAS.

- **Barometric Vertical Navigation** – For airplanes with VNAV enabled, the FMS has been demonstrated compliant with the requirements of AC20-129, regarding the barometric vertical navigation in en-route, terminal, and non-precision approach operations, when used in accordance with the limitations and operational procedures contained in this Supplement.

- For airplanes Post-Mod. SB 170-31-0019 (LOAD 19.3) or equipped with an equivalent modification factory incorporated with VGP enabled, the FMS has been demonstrated compliant with the requirements of AC90-97, regarding the use of barometric vertical navigation for instrument approach operations using decision altitude, when used in accordance with the limitations and operational procedures contained in this Supplement.

INTENTIONALLY BLANK

LIMITATIONS (LOAD PRIOR TO 27.1)

NOTE: All pages from code 01 of this supplement are applicable to airplanes equipped with Load prior to 27.1.

The following limitations are applicable to the FMS:

GENERAL LIMITATIONS

- The Honeywell Flight Management System (FMS) Pilot's Operating Manual, P/N A28-1146-179, or other approved manual must be immediately available to the flight crew in the cockpit whenever navigation is predicated on the use of the FMS. The software version stated in the Pilot's Operating Manual or other approved manual must match that displayed on the Multi Control Display Unit (MCDU) NAV IDENT page.
- The Honeywell Primus Epic FMS Airplane Database configuration must be the following:
  - Version 170-C6 and on for EMBRAER 170 models.
  - Version 175-C3 and on for EMBRAER 175 models.

MINIMUM CONFIGURATION FOR RNP 0.3 AR APPROACH OPERATIONS

- Primus EPIC load 21.4 and on.
- Single FMS version 7.03 and on – included in the Primus EPIC software.
- VGP (VGP UNAVAILABLE scratchpad message not presented on MCDU).
- 1 GPS.
- 1 IRU.
- 1 MCDU.
- 4 Display units.
- 1 TAT sensor.
- 2 RVSM Compliant Air Data Systems.
- 1 Flight Director.
- EGPWS.
- RNP AR compliant Navigation Database.

- The pilots must compare any procedures/route retrieved from the FMS database with those published on the charts. Differences between the charts and the FMS information up to 3 degrees are acceptable.
- For airplanes equipped with Load version prior to Load 25 (Load 15 to 23), RNP operations are prohibited after December 31, 2015 due to magnetic variation tables' expiration date. For airplanes equipped with Load version 25 and on, RNP operations are prohibited after December 31, 2020 due to magnetic variation tables' expiration date.
- For operations using RNP 1 (including P-RNAV) to RNP less than 2, the use of Flight Director is required.
- For operations using RNP 0.3 to RNP less than 1, the use of GPS and Flight Director is required.
- Operations requiring RNP less than 0.3 are not approved.
- RNP AR approach operations with Missed Approaches requiring RNP less than 1.0 are not approved.
- For airplanes Pre-Mod. SB 170-31-0040 (LOAD 23.1), RNP AR 0.3 procedures with RF legs smaller than 1.25 NM radius are prohibited.
- The use of VNAV requires the respective FD vertical guidance mode to be active.
- The use of FMS Speed requires the respective FD vertical guidance mode to be active.
- The use of the VNAV is prohibited when the respective FD vertical guidance mode is other than VNAV, unless pilots adjust the ALT SEL to each altitude constraint in the Flight Plan.
- The use of GPS is limited to areas where GPS is approved. De-selection of GPS should be performed in other non-approved areas.
- Prior to flight using the FMS for IFR navigation, a minimum of one VOR, DME, and IRS must be verified to be installed and operational. Also, any appropriate ground facilities (VOR, DME) that are utilized by the procedures to be flown must be verified as operational using an approved method (NOTAM, etc.).
- If GPS RAIM is annunciated as not available during terminal, en-route, or remote/oceanic operation, the pilot must monitor FMS guidance data and crosscheck against raw data from an alternate source (i.e. VOR, DME, or IRS).

- Due to priority use of GPS by the FMS, IFR Navigation using the FMS is limited to use with procedures that are referenced to the WGS-84 or NAD-83 datum, unless other appropriate authorized procedures are used.
- IFR Navigation using the FMS is prohibited unless the pilot verifies the currency of the selected navigation database cycle on the NAV IDENT page.
- IFR Navigation using the FMS is limited to geographic regions contained within the navigation database that is installed in the airplane.
- Operation above 72° 30.0' north latitude and below 59° 30.0' south latitude is prohibited due to unreliable magnetic heading, unless at least one Inertial Reference System (IRS) is verified operational as a sensor to the FMS. In this case, the system will automatically switch to TRUE.
- FMS performance management calculations have not been certified by the FAA. FMS performance management information is advisory information only, and may not be used as a basis for fuel load planning or airplane range predictions.
- Selection of FMS Position Update is prohibited during RNP and RNAV 10 operations.
- The FMS Disable selection on MCDU Radio Tune NAV page is prohibited for airplanes Pre-Mod. SB 170-31-0019 (LOAD 19.3).
- The use of the Step Climb function is prohibited.
- The selection of course interception to a conditional waypoint is prohibited.
- FMS LNAV may command bank angles above the local regulations limits (i.e. There is no automatic protection for engine out situation).

APPROACH LIMITATIONS

- ILS, LOC, LOC-BC, LDA, SDF, GLS, MLS, Visual, and Radar approaches using the FMS as the navigation source for guidance are prohibited. This limitation does not apply to RNAV Visual or FMS Visual approaches.
- FMS instrument approaches must be accomplished in accordance with approved instrument approach procedures that are retrievable from the FMS navigation database (as displayed on the APPROACH page on the MCDU). The pilot must review the complete procedure, comparing the waypoints, speeds, and altitudes displayed on the FMS with those on the published procedure charts. If any doubt exists about the integrity of the coded procedure, the procedure should not be used.
- Prior to commencing and during the final approach, the APPR annunciator must be visible on the PFD. If the APPR annunciator is not visible, and the appropriate runway visibility indications are not observed, the pilot should request a missed approach.
- When using FMS guidance to conduct an instrument approach procedure that does not include GPS in the title of the published procedure, the flight crew must verify that the procedure specified navaids(s) and associated avionics are operational (i.e. VOR, DME, ADF). If GPS RAIM is annunciated as not available during the approach, the pilot must monitor FMS guidance data and crosscheck against raw data from the alternate source(s).
- When a GPS Only Approach is planned (GPS only in title or GPS required by operational rules), prior to dispatch, the crew is required to verify that the predictive RAIM at the destination ETA is within the approach criteria. This information (RAIM AVAILABLE), is displayed on the PREDICTIVE RAIM page on the MCDU.
- When the reported station temperature exceeds the limits published in the approach chart, the use of VNAV barometric procedures are prohibited unless the pilot uses the VNAV temperature compensation function.
- Use of VNAV for a constant glide path approach procedures to a Decision Altitude is prohibited for airplanes Pre-Mod. SB 170-31-0019 (LOAD 19.3).

- Use of VNAV guidance below the published approach minimums is prohibited.
- VNAV path guidance is supplementary guidance information. The flight crew must rely on the altimeter as the primary altitude reference during the final approach segment, including step down fixes.
- For airplanes Pre-Mod. SB 170-31-0034 (LOAD 21.4), when using VGP, use of Temperature Compensation is prohibited.
- For airplanes Post-Mod. SB 170-31-0028 (LOAD 21.2) or with an equivalent modification factory incorporated, and Pre-Mod. SB 170-31-0034 (LOAD 21.4), VGP approaches are prohibited.

FMS POSITION ANOMALY

This limitation is applicable to airplanes equipped with Primus EPIC software version 23.1 or 23.2 and it is associated to the following conditions:

Crossing the 180 degree meridian will cause FMS longitude position calculation to move by approximately 180 degrees.

When the FMS position change occurs:

- The CDI will deflect indicating the offset from the desired lateral and vertical path based on the changed position;
- If autopilot is coupled and LNAV is engaged, the airplane will execute a bank maneuver to intercept the TO waypoint in the flight plan;
- For map display in heading up, map display will move to the new FMS position;
- For map display in north up, the airplane symbol will disappear from the map and move to the new FMS position;
- UNABLE RNP message will be displayed on the MCDU scratchpad;
- FMS position starts slewing back to the selected sensor positions;
- Caution EICAS message FMS1(2)-GPS POS DISAG will be displayed.

To avoid this misbehavior, perform the following procedure:

- About 10 nm before crossing 180 degree Meridian line, deselect all IRS on all FMS;
- About 10 nm after all IRS position crossed 180 degree Meridian line, reselect IRS.

If the misbehavior does occur, perform the following procedure in order to mitigate the effects:

- Select Heading Select on the Flight Guidance Panel;
- Perform FMS position update to best sensor position. This puts the FMS back to the correct position almost instantaneously;
- If synchronous operation was in use, select “RETURN TO SELECTED CONFIG”.

RUNWAY CHANGE WHEN NO ARRIVAL OR APPROACH PROCEDURE IS SELECTED

This limitation is applicable to airplanes equipped with Primus EPIC software version 23.1 or 23.2 and it is associated to the following conditions:

- The airplane is flying to a runway which neither has an arrival nor an approach procedure selected in the FMS ARRIVAL page and;
- The selected runway is the last and active waypoint on the flight planning.

If a runway change is performed, the following is observed:

- The new runway will become the “From” waypoint. The MCDU will show a discontinuity to the destination;
- The LNAV mode will be disengaged and the FD LATERAL MODE OFF caution message will be displayed on the EICAS;
- The Horizontal Track Line will be removed from the MFD MAP page.

To avoid this misbehavior and prior to insert the runway change, crews should proceed as follows:

- Perform a DIRECT TO to the destination airport;
- Clear any discontinuity in the flight plan that might appear;
- Insert the new runway;
- Check in the MOD FLT PLAN page the new runway as a “To” waypoint and then, activate the modification.

Should the crew fail to follow the procedure for a runway change, the MCDU will show the incorrect information in the MOD FLT PLAN (new runway as a FROM waypoint plus a discontinuity). In this case, crews must not activate it or even try to reinsert the desired runway through the ARRIVAL page. Instead, perform the steps described above for the runway change and activation.

If the crews activate the incorrect flight plan in the MOD FLT PLAN page, then the LNAV, if engaged, will disengage with the caution message FD LATERAL MODE OFF displayed on the EICAS. Crew should reestablish proper lateral navigation in HDG mode, accomplish the procedure above to activate the new runway and only then reengage LNAV.

NOTE: Follow the procedure above for any subsequent runway change, otherwise the MOD FLT PLAN page will display the information correctly when a new runway is inserted via ARRIVAL page, but the described misbehavior will occur once the change is activated. In this case, the ACTIVE FLT PLAN will display the information correctly and the HSI pointer will be no longer reliable.

NORMAL PROCEDURES (LOAD PRIOR TO 27.1)

NOTE: All pages from code 01 of this supplement are applicable to airplanes equipped with Load prior to 27.1.

The FMS normal operating procedures are contained in the Honeywell Flight Management System Pilot's Operating Manual.

The airplane normal operating procedures are the same as those in the basic AFM except as follows:

PRIOR TO FLIGHT

FMS Position.. INITIALIZE
Flight Plan.. ACTIVATE
Performance INIT .... SET/CONFIRM INIT

After a RTO, the performance INIT must be reconfirmed.

Takeoff Pages... SET/CONFIRM

For airplanes Pre-Mod. SB 170-31-0028 (prior to LOAD 21.2):
Fuel Used .... RESET

If RNP AR operations are intended:

RNP predictive performance capability .... CHECK

PFD NAV Source .... SELECT FMS

For airplanes Post-Mod. SB 170-31-0028 (LOAD 21.2 and on) or with an equivalent modification factory incorporated:
Speed Selector Knob... AS REQUIRED

LNAV.. SELECT
VNAV .... SELECT

BEFORE TAKEOFF, TAKEOFF AND AFTER TAKEOFF

Flight Director .... VERIFY IN-VIEW
Alt Selector Knob .... SET

NOTE: After an aborted takeoff, the performance must be reinitialized in order to the VNAV become available.

After Takeoff:

For airplanes Pre-Mod. SB 170-31-0028 (prior to LOAD 21.2):
Speed Selector Knob .... AS REQUIRED

CRUISE

AT TOC

Thrust Rating Selection (TRS) .... CRZ
With FMS Cruise Schedules in MXR SPD or MAX SPD, the TRS does not automatically transition to CRZ.

NOTE: The speed error vector on the ADI should be ignored if the FMS speed command is in Mach.

ARRIVAL

Arrival Data (STAR, if used) .... COMPARE TO CHART
Flight Director .... VERIFY IN-VIEW
LNAV .... SELECT
FGCS Vertical Mode .... SELECT

COURSE REVERSAL

A course reversal may be defined as a transition to an approach procedure in the navigation database. The course reversal appears as a Hold pattern in the flight plan (H symbol). The FMS will provide automated guidance to perform the course reversal by performing the appropriate Hold entry, as determined by the Hold pattern entry geometry. The Hold fix will be automatically sequenced after the Hold entry is performed. If a course reversal is to be flown as a direct entry, the pilot may elect not to fly the course reversal. In this case, the pilot should select the EXIT prompt on the FPL page prior to sequencing the Hold fix.

NOTE: - It is advised to conduct course reversals at speeds less than 210 kt. If course reversals are conducted at higher speeds, the crew should monitor position throughout the maneuver, to ensure protected airspace is maintained.
- Do not follow VNAV Path Deviation Indicator on the PFD during Course Reversals.

PROCEDURE TURN

A procedure turn may be defined as a transition to an approach procedure in the navigation database. The procedure turn is indicated with a P symbol in the flight plan. The FMS will provide automated guidance to perform the procedure turn. Prior to sequencing the procedure turn fix, the pilot should confirm the outbound distance and turn angle. If desired, the pilot may elect to begin the turn early by selecting the TURN prompt on the FPL page.

NOTE: It is advised to conduct procedure turns at speeds less than 210 kt. If procedure turns are conducted at higher speeds, the crew should monitor position throughout the maneuver, to ensure protected airspace is maintained.

APPROACH

The FMS may be used to provide primary guidance for the following non-precision instrument approach types: GPS, RNAV (non-GPS and GPS required types), VOR, VOR-DME, NDB, and NDB-DME.
ILS, LOC, LOC-BC, LDA, and SDF approaches can be retrieved from the navigation database and inserted into the flight plan, but cannot be used to provide primary guidance using the FMS. The FMS maps may be used during these approach types to provide supplemental data.

FMS APPROACH

If RNP AR approach is intended:

NOTE: - The procedure must be retrieved from the FMS database
- Temperature limits on the approach chart may be disregarded if the temperature compensation is in use.

Prior to the IAF:

RNP Value .... SET
The correct RNP value must be checked on the navigation chart, and inserted on the FMS, if it differs from the default value.

VOR/DME Sensor .... DESELECT
On the POS SENSOR page deselect the VOR/DME sensor on FMS1 and FMS2.

Throughout all the approach sequence:

Track Deviation .... MONITOR
The deviation must not exceed the RNP value (1xRNP) or +/-75 feet vertically.

At the IAF:

Altimeters .... SET & X-CHECK

- Set the current local altimeter setting. Use of remote altimeter settings is not authorized for RNP AR approach operations.
- If the altimeters difference exceeds 100 ft, abandon the approach.

Approach Data .... COMPARE TO CHART
Approach Speeds.. VERIFY
Go Around Speeds.. VERIFY

NOTE: FMS does not correct Approach and Go Around speeds for non-standard conditions.

Baro Altitude.. SET
Minimums... SET
LNAV... SELECT
VNAV .... SELECT

Speed Selector Knob .... FMS
Autopilot .... ENGAGED

At the FAF:

Speed Selector Knob .... MAN
Speed .... AS REQUIRED
Approach on PFD .... CONFIRM AT FAF

At 400 ft AGL:

Autopilot .... DISENGAGE

NOTE: - The APPR annunciator must be monitored throughout final approach. If the APPR annunciator is not displayed, and the appropriate runway visibility indicators are not confirmed, then the pilot should declare a missed approach.

- During approaches with VNAV engaged, the Altitude Pre Selector must be set to altitudes lower than current airplane altitude.

- When VGP mode is engaged, the FMS descent path will not be restricted by the altitude pre-selector.

FMS TO NON-PRECISION LOC APPROACH

There is no procedure to use the FMS to transition automatically to a non-precision LOC based approach. This includes LOC Only, LDA, and SDF types. Refer to the FGCS section of this manual for non-precision LOC procedures.

FMS TO LOC-BC APPROACH

NOTE: This procedure assumes LNAV and VNAV is previously active.

FMS Tune .... CONFIRM AUTO
Approach Speeds .... VERIFY
Go Around Speeds .... VERIFY

NOTE: FMS does not correct Approach and Go Around speeds for non-standard conditions.

Preview LOC .... SELECT
Baro Altitude .... SET
Minimums .... SET

At the IAF:

Localizer Frequency .... CONFIRM SET
Localizer Frontal Course .... CONFIRM SET
When established on intercept to final approach course:
Approach Mode on Guidance Panel .... SELECT

At the FAF:

Speed Selector Knob .... MAN
Speed .... AS REQUIRED
Localizer on PFD .... VERIFY ACTIVE NAV SOURCE
Lateral Deviation Indication .... VERIFY VALID
FGCS Back Course Mode .... CONFIRM ACTIVE

FMS TO CAT I ILS APPROACH

NOTE: This procedure assumes LNAV and VNAV are previously active.

FMS Tune .... CONFIRM AUTO
Approach Speeds .... VERIFY
Go Around Speeds .... VERIFY

NOTE: FMS does not correct Approach and Go Around speeds for non-standard conditions.

Localizer Preview .... SELECT
Minimums .... SET

At the IAF:

Localizer Frequency .... CONFIRM SET
Localizer Frontal Course .... CONFIRM SET
When established on intercept to final approach course:
Approach Mode on Guidance Panel .... SELECT

At the FAF:

Speed Selector Knob .... MAN
Speed .... AS REQUIRED
Localizer on PFD .... VERIFY ACTIVE NAV SOURCE
FGCS APPR1 Mode .... CONFIRM ACTIVE

FMS TO CAT II ILS APPROACH

NOTE: This procedure assumes LNAV and VNAV are previously active.

FMS Tune .... CONFIRM AUTO
Approach Speeds .... VERIFY
Go Around Speeds .... VERIFY

NOTE: FMS does not correct Approach and Go Around speeds for non-standard conditions.

Localizer 1 Preview.. SELECT PFD1
Localizer 2 Preview.. SELECT PFD2
Comparator Flags on PFD... NONE
Minimums .... SET DH ON BOTH PFD

At the IAF:

Localizer Frequency.. CONFIRM SET
Localizer Frontal Course... CONFIRM SET
When established on intercept to final approach course:
Approach Mode on Guidance Panel................... SELECT

At the FAF:

Speed Selector Knob.. MAN
Speed .... AS REQUIRED
Localizer on PFD .... VERIFY ACTIVE NAV SOURCE
FGCS APPR2 Mode.. CONFIRM ACTIVE

NOTE: Comparator flags on the PFD include those for Air Data source and Attitude source. The on-side ADS and IRS sources should be selected. If a miscompare occurs that results in lack of ability to select independent sources, APPR2 will not be possible.

LANDING

The system does not support landing v-speeds display for touch and go operations.

MISSED APPROACH

LNAV .... SELECT
GO-AROUND Procedure .... APPLY
Navigation Source .... FMS
Altitude .... SET

NOTE: Selection of the TO/GA button will result in FGCS lateral mode of wings level ROLL and Go-Around vertical mode. The Go-Around mode results in 8° nose up, which will then change to speed hold mode if landing speeds are entered. With both engines operative, speed hold will be V_{REF} + 20 KIAS. With only a single engine, speed hold will be Approach Climb Speed. If landing speeds are not entered, GA mode will provide continued fixed pitch.

HOLD PATTERN

If a Holding Pattern is defined, the pilot must perform the following prior to sequencing the Hold fix:

Speed.. AS REQUIRED
Hold Entry Type .... VERIFY
Hold Inbound Course.. VERIFY
Hold Turn Direction.. VERIFY
Hold Leg Time/Distance .... VERIFY

If the Hold is defined as a Hold to an Altitude, as part of a procedure from the navigation database, the pilot must select the EXIT prompt on the FPL page when the Hold Altitude termination point is reached.

NOTE: If Holding patterns are conducted at speeds higher than 210 kt, the crew should monitor position throughout the maneuver, to ensure protected airspace is maintained. The Hold pattern may be exited at any time by selecting the EXIT prompt on the FPL page on the MCDU. If Hold exit is selected on the outbound leg, guidance will be provided to immediately turn and capture the inbound course to the Hold fix. If Hold exit is selected on the inbound leg, guidance will be provided to continue to the Hold fix. The Hold fix will then be automatically sequenced.

INTENTIONALLY BLANK

EMERGENCY AND ABNORMAL PROCEDURES (LOAD PRIOR TO 27.1)

NOTE: All pages from code 01 of this supplement are applicable to airplanes equipped with Load prior to 27.1.

All FMS Action/Malfunction Messages are described in the Honeywell Flight Management System Pilot's Operating Manual.

The airplane abnormal operating procedures are the same as those in the basic AFM except as follows:

DEGRADED NAVIGATION

The DGRAD annunciator is displayed on the PFD when the accuracy and integrity of the system does not meet the requirements for the current RNP or Approach type. The UNABLE RNP or GPS APPR RAIM UNAVAIL scratchpad message will also be displayed.

If a DGRAD annunciation is displayed, the pilot should select the offside FMS, if available. If the off-side FMS is not available, procedures should be followed as described in the following table, and detailed in the paragraphs below:

DGRAD Procedures (Off-side FMS not Available)	
Operation	**Required Action**
Non-RNP Terminal or En-route (including B-RNAV)	Crosscheck FMS data with raw data from VOR, DME, and NDB. De-select error causing sensor, if detectable.
P-RNAV	Contact ATC, advise inability to continue P-RNAV.
RNP Terminal, En-route, Remote	Contact ATC and advise inability to continue RNP operations.
Non-RNP (excluding GPS required) Approach	Use alternate source (VOR, NDB) if available. If not, declare Missed Approach.
RNP 0.3 and GPS required Approach	Declare Missed Approach.
Non-RNP Remote	Crosscheck FMS data with raw data from GPS, IRS. De-select error causing sensor, if detectable.

During conventional (non-RNP) terminal and en-route operations and B-RNAV operations, the degraded FMS may continue to be used for navigation, provided the crew can confirm FMS guidance data through other means, such as cross checking VOR and DME raw data. Perform a cross-comparison of all sensor positions and station bearing/distance data, and de-select the error-causing sensor, if it is detected. In the case of B-RNAV, if the FMS is not able to provide continued guidance, ATC must be notified of the loss of B-RNAV capability.

During P-RNAV operations or RNP based terminal, en-route, or remote operations (including RNP-10), the degraded FMS may not be used to continue operations. If the offside FMS is not available, the pilot must contact ATC and notify of the inability to continue P-RNAV or RNP operation.

If conducting a non-RNP instrument approach, discontinue use of the degraded FMS for approach guidance and select an alternate source of navigation, if available (VOR, NDB). If an alternate source is not available or time does not permit, declare missed approach.

If conducting an RNP-0.3 approach, the degraded FMS may not be used to continue the approach. If the offside FMS is not available, declare a missed approach.

During conventional remote/oceanic operations, the FMS may continue to be used for navigation, provided the crew can confirm FMS guidance data through other means, such as cross checking GPS and IRS raw data. Perform a cross-comparison of all sensor positions and de-select the error-causing sensor, if it is detected.

DEAD RECKONING

The DR annunciator is displayed on the PFD when the FMS has been performing position computations without any sensors for a set time after a degraded navigation event occurs (DRGAD). The accuracy and integrity of the FMS guidance data cannot be ensured in this mode.

The pilot should discontinue use of the FMS when in it is in DR mode. If there is no alternative means of navigation (off-side FMS, VOR, etc.), the pilot may elect to perform manual position updates to the FMS in the DR condition, using reference point fly-over techniques, to minimize the navigation error. In this case, ATC must be notified of the loss of navigation capability on the airplane.

ENGINE FAILURE

For airplanes with VNAV enabled:

Engine Failure Procedure .... ACCOMPLISH
Speed Selector Knob .... MAN
Altitude .... SET
FMS Cruise Altitude .... AS REQUIRED

FMS FAILURE

An FMS failure is indicated by the loss of all data on the PFD and MFD maps. All data will be blanked, or dashed. A large “X” is displayed in place of the lateral deviation indicator. An “FMS1 FAIL” or “FMS2 FAIL” CAS message will also be displayed.

If an FMS failure occurs, the offside FMS should be selected. If the offside FMS is not available, the following procedures should be followed, based on the nature of the operation:

FMS Failure Procedures (Off-side FMS not Available)

Operation	Required Action
Non-RNP Terminal or En-route	Use alternate source (VOR, NDB, DME).
B-RNAV, P-RNAV, or RNP operations	Contact ATC and declare inability to continue B-RNAV, P-RNAV, or RNP operations.
Non-RNP (excluding GPS required) Approach	Use alternate source, if available (VOR, NDB). If not available, declare missed approach.
RNP-0.3 or GPS required approach	Declare Missed Approach.
Remote Operations	Contact ATC and declare loss of long range navigation capability.

PERFORMANCE (LOAD PRIOR TO 27.1)

NOTE: All pages from code 01 of this supplement are applicable to airplanes equipped with Load prior to 27.1.

The Honeywell Primus Epic FMS provides features to comply with Required Navigation Performance requirements, as described in RTCA DO-283, Minimum Operational Performance Specification for Required Navigation Performance, Rev. -, Oct. 2002.

The FMS has not been demonstrated to comply with the VNAV requirements stated in Appendix H of DO-283. The FMS does not provide the capability to utilize the RNP value from the procedures in the navigation database. Fixed radius leg transition capability is not provided. The FMS does not provide constant radius Hold patterns, or RNP Hold entries, as defined in Appendix J of DO-283.

The FMS provides default RNP types for each phase of flight. Each RNP type has a required steering method, which is necessary to maintain containment integrity. The default RNP types and their associated steering methods are as follows:

Flight Phase	RNP Value	Minimum Required Steering Method
Remote/Oceanic	see note (1)	Manual CDI
En-route	2	Manual CDI
Terminal	1	Flight Director
Approach	see note (2)	Flight Director
Missed Approach	1	Flight Director

NOTE: 1) The default RNP value for Remote/Oceanic is:

- 10 for airplanes equipped with Load version prior to Load 25.1.0.1 (Pre-Mod. SB 170-31-0044);
- 4 for airplanes equipped with Load 25.1.0.1 and on (Post-Mod. SB 170-31-0044 or with an equivalent modification factory incorporated).

2) The default RNP value for Approach is:

- 0.3 for airplanes equipped with Load version prior to Load 25.3 (Pre-Mod. SB 170-31-0051) or prior to Load 25.4 (Pre-Mod. SB 170-31-0047), performing any approach using FMS;
- 0.5 for airplanes equipped with Load 25.3 (Post-Mod. SB 170-31-0051), Load 25.4 and on (Post-Mod. SB 170-31-0047) or with an equivalent modification factory incorporated, performing radio-based approach. For RNAV approaches the default value remains 0.3.

The default RNP values above do not constitute airworthiness or operational approval for the respective RNP types. Refer to NAVIGATION OPERATIONAL APPROVALS for the FMS RNP capabilities.

When the FMS is selected as the navigation source on the PFD, the scale of the CDI will be based on the displayed active RNP value. The two-dot, full-scale deflection of the CDI will always be equal to the RNP value (1xRNP) displayed on the PFD.

The FMS does not provide an indication to the crew of an excessive lateral (cross-track) deviation. Lateral deviation is not considered in the display of the RNP integrity alert. It is the pilot’s responsibility to monitor lateral deviation, and take appropriate action to ensure the airplane follows the flight plan with minimal error.

The steering sources required for each RNP type assume worst case position determination by the FMS. Regardless of the sensors in use, the RNP integrity alert will always be provided at any time the current position determination mode of the FMS does not yield satisfactory accuracy and integrity to satisfy the containment requirements for the active RNP type.

GPS mode is given the highest priority for position determination, when GPS HIL is within limits. If GPS is not available, the FMS will utilize radio modes (DME-DME or VOR-DME) if they provide satisfactory accuracy. If radio modes are not available, the FMS will use IRS data.

The FMS computes an Estimate of Position Uncertainty (EPU), which is displayed with the current position determination mode on the PROGRESS page on the MCDU.

If the EPU is greater than the active RNP for a set period of time (determined by phase of flight), the FMS will provide an alert (DGRAD on the PFD and UNABLE RNP on the MCDU scratchpad) to notify the crew that the system does not have the necessary accuracy or integrity to maintain RNP operations for the current RNP type. The following table describes the relationship between phase of flight and the time to alarm.

Flight Phase	Time to Alarm (sec)
Remote/Oceanic	54
En-route	24
Terminal	6
Approach	6

Refer to the ABNORMAL PROCEDURES section of this manual supplement for details regarding procedures for degraded navigation.

The FMS also provides annunciations to alert the crew of an inability to meet the RNP for future flight plan legs. Refer to the Honeywell Primus Epic FMS Pilot's Operating Manual for further details regarding system features and annunciations.

SUPPLEMENT 5

CAT II OPERATION

TABLE OF CONTENTS

GENERAL

This supplement provides information required for CAT II operation when the appropriate equipment and instruments are approved, installed and in an operable condition. The information herein presented replaces or complements the equivalent information in the basic AFM.

This AFM Supplement does not constitute operational approval or credit for Category II operation. Approval must be obtained from the appropriate regulatory authority prior to conducting these operations.

For limitations, procedures and performance information not contained in this Supplement refer to the basic AFM and applicable supplements.

CAT II ENGAGEMENT LOGIC

The Primus-Epic integrated Avionics has a CAT II logic which is automatically activated whenever the RA/BARO Minimums Selector knob is set to RA position. A green APPR 2 annunciator indicates the correct setting and a white or amber APPR 1 ONLY annunciator indicates an incorrect setting. The green APPR 2 annunciator is displayed in the Autopilot Approach Status Annunciator above each FMA.

NOTE: Although the radio altitude setting may be adjusted down to 80 ft, if requested by an ILS Cat II Approved Chart, the Decision Height (DH) is limited to 100 ft above ground level.

CAT II CONDITIONS OF OPERATION

CAT II operation is allowed only with the green APPR 2 annunciator enabled.

To obtain a green APPR 2 annunciator the following conditions must be met:

- Radio altitude below 1500 ft.
- Flaps 5.
- NAV 1 on pilot's side and NAV 2 on copilot's side, both NAV’s tuned to the same LOC frequency.
- An active approach GS/LOC mode selected. Both courses set to same value.

- Both Flight Directors operational.
- Attitude and Heading valid on both PFD's.
- Glide slope and Localizer deviation valid on both PFD's.
- No reversions (IRS and ADC) modes selected on both PFD's.
- Valid Airspeed and Baro Altitude on both PFD's.
- No comparison monitors are tripped (FPA, Attitude, Heading, Airspeed, Baro Altitude, Localizer, Glide slope and Radio altitude) on both PFD's.
- No back course selected.
- The EICAS message APPR 2 NOT AVAIL not presented.
- Both Display Control Panels set to the same CAT II Decision Height.
- RA/BARO Minimums Selector knob set to RA.
- No TCS Button pressed.

NOTE: When the green APPR 2 annunciator is enabled, the localizer lateral deviation scale is expanded with the external limits representing the excessive deviation points.

If the green APPR 2 annunciation is displayed and one of the following conditions is achieved, the amber APPR 1 ONLY annunciation will flash active characters inverse video for 5 seconds then steady in conjunction with the RA Minimum Selected Digital Readout:

- No valid Radio Altitude displayed.
- Airplane no longer APPR 2 capable.
- Crew selects flaps position other than 5 below 800 ft.
- EICAS message SLAT-FLAP LEVER DISAG displayed.
- Either Minimums Selected Readouts change from RA to BARO.
- LOC frequency or inbound course mismatch.

CAT II WARNINGS

LOCALIZER, GLIDE SLOPE AND RADIO ALTITUDE COMPARATORS WARNINGS

A comparison between the localizer, glide slope and radio altitude deviation indications are performed when the following conditions are met:

- On-side radio altitude valid and below 1500 ft.

- APR mode selected on Flight Guidance Panel.
- Flaps 5.
- CAT II Decision Height setting on both Display Control Panels.
- On-side VOR/LOC active course valid.
- Cross-side data valid.
- Go-around not selected on either side.
- No back course selected.

For localizer, the following additional condition is required:

- Both LOC signals tuned and valid for at least 15 seconds.

If LOC indications differ by values above approximately 1/2 dot, an amber LOC annunciator will appear flashing (for 10 seconds) then steady on the left side of the PFD's between EADI and EHSI.

For glide slope, the following additional condition is required:

- Both glide slope signals valid and both LOC signals tuned and valid for at least 15 seconds.

If GS indications differ by values above approximately 2/3 dot, an amber GS annunciator will appear flashing (for 10 seconds) then steady on the left side of the PFD's between EADI and EHSI.

For radio altitude, the following additional condition is required:

- Both radio altimeters signals valid and on scale.

If radio altimeters indications differ more than 10 ft approximately, an amber RA annunciator will appear flashing (for 10 seconds) then steady in the ADI.

EXCESSIVE LOCALIZER AND GLIDE SLOPE DEVIATIONS WARNINGS

The on-side localizer and glide slope excessive deviations are compared to the Cat II limits and displayed when the following conditions are met:

- APR mode selected on Guidance Panel.
- Flaps 5.
- CAT II Decision Height setting on Guidance Panel.
- VOR/LOC is the active course is valid.
- On-side radio altitude between 500 and 80 ft.
- On-side localizer tuned and valid.

- On-side glide slope valid.
- No back course selected.
- Go-around not selected on either side.

Localizer excessive deviation:

If a localizer deviation greater than approximately 1/3 dot is detected, the HSI lateral deviation bar on the PFD's HSI will change from green to amber, the lateral deviation scale will change from white to amber, and flash.

NOTE: The on-side excessive deviation warning is also displayed when the cross-side system has detected an excessive deviation.

Glide slope excessive deviation:

If a glide slope deviation greater than approximately one dot is detected, the GS pointer on the PFD's ADI will change from green to amber, the GS scale will change from white to amber, and flash.

NOTE: The on-side excessive deviation warning is also displayed when the cross-side system has detected an excessive deviation.

INTENTIONALLY BLANK

LIMITATIONS

MINIMUM EQUIPMENT REQUIRED

The performance of Category II approaches has been demonstrated to meet the airworthiness requirements of FAA AC 120-29A – Appendix 3 and CS AWO Subpart 2 requirement, when the following equipment are installed and operative:

- 2 Inertial Reference Systems;
- 2 Flight Director Systems;
- 2 Primary Flight Displays (PFD);
- Windshield Wipers;
- 2 VOR/ILS NAV Systems;
- 1 VHF/COMM System;
- Cat II Engagement Logic;
- 1 Radio Altimeter;
- 1 Ground Proximity Warning System (EGPWS);
- 2 Air Data Systems (ADS);
- Rudder in Normal Mode;
- SPOILER FAULT message not presented.

For CAT II operation with one engine inoperative, the following also applies:

- 1 Autopilot System Channel must be operative.
- Manual FD (Flight Director) Category II ILS approaches are prohibited.

For CAT II operation with airplanes Pre-Mod. SB 170-31-0010, the following also applies:

- The one engine inoperative CAT II operation is prohibited.
- 1 autopilot system channel must be operative.
- Manual FD (Flight Director) Category II ILS approaches are prohibited.

AUTOPILOT SYSTEM

Minimum Use Height (MUH) .... 50 ft

NOTE: Coupled go-around height loss may be 50 ft.

APPROACH AND LANDING FLAPS

CAT II approach and landing must be performed with flaps 5.

NORMAL PROCEDURES

CAT II APPROACH

APPROACH

- Perform the approach briefing and the Descent/Approach checklists.
- Set approach speeds.
- Set the RA/BARO Minimums Selector knob to RA and the CAT II DH minimum on both Display Control Panels.
- Test Radio Altimeter if only one is available.
- Select the same ILS frequency on both MCDU.

NOTE: A minimum distance of 4 NM to the Outer Marker is recommended for interception and stabilization along the approach course.

BEFORE LANDING

- Perform the before landing checklist.
- Set the airspeed bug to the approach speed (AP).
- Set the airspeed bug to the Approach Speed and bled off in such a way that over the threshold the target speed is at reference speed.
- At 80 ft above the decision height, the EGPWS will call out “APPROACHING MINIMUMS”.

NOTE: If the RA is set to OFF, there is no EGPWS approach call outs.

- If no visual contact is made upon reaching the decision height or if any malfunction could not be promptly identified during approach, a missed approach must be immediately initiated.

MISSED APPROACH

GO-AROUND Procedure .... APPLY

LANDING

Reaching the Decision Height with runway in sight:

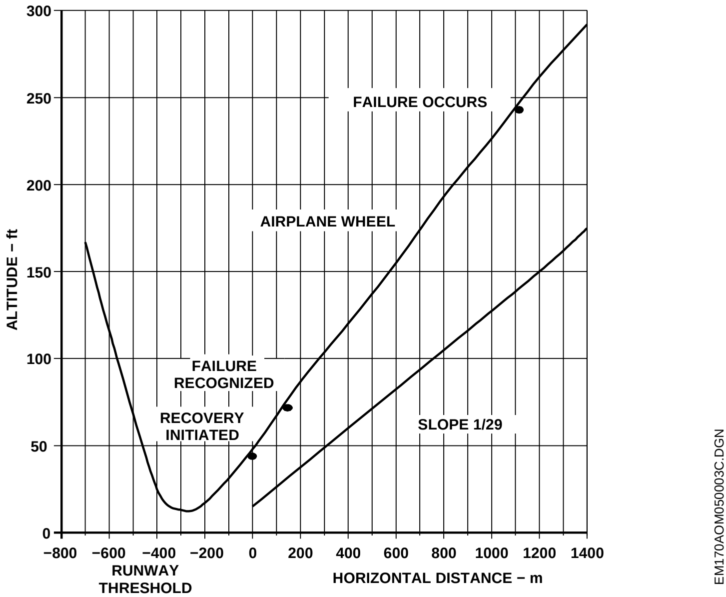
Autopilot .... DISENGAGE
Landing .... PERFORM

EMERGENCY AND ABNORMAL PROCEDURES

ALTITUDE LOSS

The demonstrated altitude loss due to a pitch down hardover during flight test is presented in the graph below.

- Recovery initiated 1 second after failure recognition:



NOTE: The maximum demonstrated altitude loss due to autopilot malfunction is 20 ft.

ABNORMAL PROCEDURES

HARDOVER

If any unusual acceleration or motion is noticed on the airplane flight path the approach must be discontinued, and:

Autopilot .... DISENGAGE
MISSED APPROACH Procedure .... PERFORM AS REQUIRED

Perform a normal MISSED APPROACH Procedure, unless the approach is continued under visual conditions and the airplane position and attitude assure a safe landing.

SLOWOVER

The Slowover consists in a smooth and slow airplane attitude change due to an autopilot system malfunction. It may be recognized if one of the following symptoms occurs during approach:

– Unusual glide slope small deviation.
– Change in the rate of descent (small or large).
– Excessive glide slope deviation and the GS indications becoming amber.
– Autopilot self disconnection.

If a Slowover tendency is confirmed:

Autopilot .... DISENGAGE
MISSED APPROACH Procedure .... PERFORM AS REQUIRED

NOTE: Consider the possibility of continuing and performing the landing if under visual conditions and the airplane position and attitude assure a safe landing.

ENGINE FAILURE ON FINAL APPROACH OR DURING GO-AROUND

Go-Around .... PERFORM

AUTOPILOT MALFUNCTION

BEFORE REACHING FAF

If the autopilot disengages or has to be disengaged, try to reengage it.

If the autopilot disengages again:

MISSED APPROACH Procedure .... PERFORM AS REQUIRED

NOTE: Consider the possibility of continuing and performing the landing if under visual conditions and the airplane position and attitude assure a safe landing.

AFTER REACHING FAF

If the autopilot disengages or has to be disengaged, do not reengage the autopilot.

MISSED APPROACH Procedure .... PERFORM AS REQUIRED

NOTE: Consider the possibility of continuing and performing the landing if under visual conditions and the airplane position and attitude assure a safe landing.

DISPLAY WARNINGS DURING FINAL APPROACH

Discontinue the approach if any of the following warnings occur:

- APPR 1 ONLY displayed on Autopilot Approach Status Annunciator,
- EICAS message APPR 2 NOT AVAIL presented,
- RALT FAIL (cyan),
- RA (amber),
- GS (amber),
- LOC (amber),
- PIT (amber),
- HDG (amber),
- CAS (amber),
- FPA (amber).

Perform a normal MISSED APPROACH Procedure, unless the approach is continued under visual conditions and the airplane position and attitude assure a safe landing.

EXCESSIVE DEVIATION WARNING

If warning occurs above 200 ft Radio Altitude:
Monitor the ILS deviation to ensure that the airplane returns to the center beam. If not recovered up to 200 ft radio altitude:
Discontinue the approach.

If warning occurs below 200 ft Radio Altitude:
Discontinue the approach.

In both cases, perform a normal MISSED APPROACH Procedure, unless the approach is continued under visual conditions and the airplane position and attitude assure a safe landing.

ABNORMALITIES

The following abnormalities are deviation from CAT ll ILS tracking normal range and must be called out:

- Excessive LOC or GS deviations.
- Airspeed 10 kt higher or 5 kt lower than the Landing Reference Speed ($V_{REF\ 5}$).
- Roll angle in excess of 25°.
- Pitch angle below - 5° or above 5°.
- Rate of descent in excess of 1200 ft/min.

PERFORMANCE

The performance data required for CAT II operations are presented by basic CAFM output tables and must be calculated previously.

Operational regulations may require additional CAFM landing distance adjustment.

	ENGINES	TLA	FLAPS	GEAR	AIRSPEED
APPROACH CLIMB	1	TO/GA	2	UP	APPROACH CLIMB SPEED
LANDING CLIMB	2	TO/GA	5	DOWN	$V_{REF\ 5}$ (1)
LANDING	2	IDLE	5	DOWN	$V_{REF\ 5}$ (1)

NOTE: 1) The Landing Reference Speed (V_{REF5}) for CAT II operations is the appropriate speed obtained from the CAFM and differs from the V_{REF5} used during the Category I operations.

DEMONSTRATED WIND COMPONENTS

Headwind .... 25 kt
Tailwind .... 10 kt
Crosswind .... 12 kt

These demonstrated values are not considered to be limiting.

INTENTIONALLY BLANK

SUPPLEMENT 6

RVSM OPERATION

TABLE OF CONTENTS

GENERAL

INTRODUCTION

This Supplement is provided to present the data required for operation in the RVSM (Reduced Vertical Separation Minimum) airspace. The RVSM operation reduces the EMBRAER 170 minimum vertical separation from 2000 ft to 1000 ft between FL 290 and FL 410.

Airworthiness approval alone does not authorize flight into airspace for which an RVSM operational approval is required by an ICAO Regional Navigation Agreement.

The information herein presented must replace or complement the equivalent data in the basic AFM.

LIMITATIONS

MINIMUM EQUIPMENT REQUIRED

During RVSM operation it is necessary that the following equipment and instruments be in proper operating condition:

- 2 RVSM Compliant Air Data Systems;
- 1 Autopilot with Altitude Hold Mode operative;
- 1 Altitude Alerter;
- 1 Transponder.

NOTE: - For airplanes EMBRAER 170 model Post-Mod. SB 170-34-0009 or equipped with equivalent modification factory incorporated, the ADS 1, ADS 2 and ADS 3 are compliant with RVSM operation.

- For airplanes EMBRAER 170 model Pre-Mod. SB 170-34-0009, only the ADS 1 and ADS 3 are compliant with RVSM operation, the ADS 2 must not be used for RVSM operation and the airspeed is limited to Mach 0.8.

- The ADS 3 is not considered RVSM compliant in case of loss of sideslip compensation, i.e., with the EICAS message ADS 3 SLIPCOMP FAIL displayed.

- The IESS must not be used for RVSM operation.

- Should any of the required equipment fail prior to the airplane entering RVSM airspace, the pilot should request a new clearance to avoid entering this airspace.

- An operating transponder may not be required for entry into all designated RVSM airspace. The local authority determines the requirements for an operational transponder in each area where operations are intended.

INTENTIONALLY BLANK

NORMAL PROCEDURES

The actions listed below must complement the procedures contained in the basic AFM. The remaining Normal Procedures section remains unchanged.

EXTERNAL SAFETY INSPECTION

NOSE SECTION

Air Data Smart Probes..NO DAMAGE OR OBSTRUCTION

Particular attention should be paid to the condition of the pressure ports and to the marked area on the fuselage skin near each Air Data Smart Probe.

BEFORE TAKEOFF

Altimeters..SET TO THE AIRFIELD QNH
Altitude Indications..CHECK

NOTE: - An alternative procedure using QFE may also be used;
- The maximum difference between altimeters indication should not exceed 75 ft (23 m).

CRUISE

Be sure that all required equipment are in proper operating condition.

Ensure that the airplane is flown at the cleared flight level and that ATC clearances are fully understood and followed. Do not depart from cleared flight level without a positive clearance from ATC except for a contingency or emergency situation.

While changing flight levels, do not overshoot or undershoot the cleared flight level by more than 150 ft (45 m).

The autopilot should be operative and engaged during level cruise, except for circumstances such as the need to re-trim the airplane or when it must be disengaged due to turbulence.

When altitude difference between PFD 1 and PFD 2 exceeds 180 ft, select ADS 3 on the PFD that does not agree with IESS.

AFTER LANDING

In case of failure or malfunction, the following information should be recorded when appropriate:

- ADS 1, ADS 2, ADS 3 altimeter readings;
- Altitude selector setting;
- Baro Set value and Baro Set unit (INHG/HPA);
- Flight Director used with the Autopilot to control the airplane and any differences when the other Flight Director was coupled;
- Use of air data system reversion for fault diagnosis procedure;
- The transponder selected to provide altitude information to ATC and any difference noted when an alternative transponder was selected.

EMERGENCY AND ABNORMAL PROCEDURES

The actions listed below must complement the procedures contained in the basic AFM. The remaining Emergency and Abnormal Procedures section remains unchanged.

- In case of emergency or abnormal situation or contingencies (equipment failures, weather, etc.) which affect the ability to maintain the cleared flight level, notify ATC and co-ordinate an action plan that is appropriate to the airspace concerned;
- Notify ATC when encountering greater than moderate turbulence;
- If unable to notify ATC and obtain an ATC clearance prior to deviating from the cleared flight level, follow any established contingency procedures and obtain ATC clearance as soon as possible.

PERFORMANCE

Performance Data presented in the basic AFM remain unchanged.

INTENTIONALLY BLANK

APPENDICES

TABLE OF CONTENTS

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX 1

CONFIGURATION DEVIATION LIST

TABLE OF CONTENTS

INTENTIONALLY BLANK

INTRODUCTION

This Configuration Deviation List contains additional certificate limitations for operation of the airplane without certain secondary airframe and engine parts as listed herein. When the airplane is operated using the CDL, the limitations specified in the AFM must still be complied with, as amended in this Appendix. All the items that are related to the airworthiness of the airplane and not included on the list are automatically required to be installed.

The associated limitations must be listed on a placard affixed in the cockpit in clear view of the pilots and other appropriate crewmember(s). The pilot in command should be notified of each operation with a missing part(s) by listing the missing part(s) in the flight or dispatch release. The operator should list in the airplane logbook an appropriate notation covering the missing part(s) on each flight.

If an additional part is lost, the airplane may not depart the airport at which it landed following this event, until it complies with the limitation of the CDL. This, of course, does not preclude the issuance of a ferry permit to allow the airplane to be flown to a point where the necessary repairs or replacement can be made.

No more than one part for any one system may be missing, unless specific combinations of parts are included in the CDL. Unless otherwise specified, parts from different systems may be missing. The performance penalties are cumulative, unless specifically designated penalties are indicated for the combination of missing parts.

Where performance penalties are listed as negligible, no more than three negligible items may be missing without taking further penalty. For each missing item more than three, reduce the takeoff, landing and enroute climb limits by 100 lb (45 kg). Where performance penalties are listed as no penalty, any accumulative number of items listed as no penalty may be missing without further penalty.

Takeoff performance penalties should be applied to the takeoff weights that are limited by performance considerations (i.e., takeoff field length, first, second, or final segment climb, or takeoff flight path).

If the performance-limited takeoff weight is greater than the maximum certified takeoff weight, the takeoff performance penalties should be applied to the maximum certified takeoff weight to ensure compliance with the noise requirements.

Landing performance penalties should be applied to the landing weights that are limited by performance considerations (i.e., landing field length, landing climb, or approach climb). If the performance-limited landing weight is greater than the maximum certified landing weight, the landing performance penalties should be applied to the maximum certified landing weight to ensure compliance with the noise requirements.

En route performance penalties apply only to operations that are limited by the one-engine inoperative en route climb performance.

Refer to the Aircraft Maintenance Manual TASK 51-22-01-910-801A for speed tape application, inspection procedure, and replacement instructions information. The use of speed tape is time limited to 120 days.

If the CDL item refers to a MMEL item, the MMEL conditions, limitations and repair interval must be applied.

COMPONENT LOCATION

The numbering and designation of each system in this Appendix is based on ATA Spec. 2200. The parts within each system are identified by its functional description and, when necessary, by door or panel identification. See Maintenance Manual, Chapter 06, for panel identification.

CONFIGURATION DEVIATION LIST

System & Sequence Number / 1. ITEM	2. Number installed	3. Number required for dispatch	4. Remarks and/or exceptions
23 COMMUNICATIONS			
61-00 Static Dischargers	32	24	A maximum of 8 (eight) static dischargers may be missing with no penalty. At least the following dischargers are required to be installed: a) 5 (five) on each winglet; b) 2 (two) on each aileron; c) 3 (three) on each elevator, and d) 4 (four) on rudder/vertical stabilizer.

INTENTIONALLY BLANK

CONFIGURATION DEVIATION LIST

System & Sequence Number — ITEM	1.	2. Number installed	3. Number required for dispatch	4. Remarks and/or exceptions
28 FUEL				
42-01 Magnetic Level Indicators		6	0	Any number or combination may be missing with no penalty provided: a) There is no evidence of leakage, and b) Cavity is covered with speed tape. Refer to MMEL 28-42-00.

INTENTIONALLY BLANK

CONFIGURATION DEVIATION LIST

System & Sequence Number / 1. ITEM	2. Number installed	3. Number required for dispatch	4. Remarks and/or exceptions
32 LANDING GEAR			
12-01 Main Landing Gear Door (Upper and Lower)	4	3	One may be missing provided for CAFM performance calculation a Drag Index of 152 is applied. **NOTE:** Main Landing Gear Middle Door must be installed.
12-02 Main Landing Gear Middle Door Seals	4	0	Any number or combination may be missing or partially missing provided for CAFM performance calculation a drag Index of 4 is applied.
49-01 Main Landing Gear Wheel Fairing Assembly (if installed)	2	0	One or both may be missing with no penalty. **NOTE: -** When the Wheel Fairing is removed or missing the associated supports must also be removed. **-** Items 32-12-01 and 32-49-01 may be missing simultaneously with no additional penalty.

INTENTIONALLY BLANK

CONFIGURATION DEVIATION LIST

System & Sequence Number / 1. ITEM	2. Number installed	3. Number required for dispatch	4. Remarks and/or exceptions
33 LIGHTS			
41-01 Nose Gear Landing Light Assembly	1	0	May be missing with no penalty. Refer to MMEL 33-41-00.
42-01 Nose Gear Taxi Light Assembly	1	0	May be missing with no penalty. Refer to MMEL 33-42-00
43-01 Aft Navigation Light Lens (Airplanes with Halogen lights type)	2	0	One or both may be missing with negligible penalty provided affected lights are deactivated and considered inoperative. Refer to MMEL 33-43-00 and 33-47-00.
43-02 Aft Navigation/Strobe Light Assembly (Airplanes with Enhanced Wing Tip or Post-Mod. SB-170-57-0058)	2	0	One or both may be missing with negligible penalty provided affected lights are deactivated and considered inoperative. Cover the cavity with speed tape. Refer to MMEL 33-43-00 and 33-47-00.
44-01 Wing Inspection Light Lens (Airplanes with Halogen lights type)	2	0	One or both may be missing with no penalty provided: a) Cavity is covered with blanking plate, and b) Affected light is deactivated and considered inoperative. Refer to MMEL 33-44-00.

CONFIGURATION DEVIATION LIST

System & Sequence Number / 1. ITEM	2. Number installed	3. Number required for dispatch	4. Remarks and/or exceptions
33 LIGHTS			
44-02 Wing Inspection Light Lens (Airplanes with LED lights type)	2	0	One or both may be missing with no penalty provided: a) Cavity is covered with speed tape, and b) Affected light is deactivated and considered inoperative. Refer to MMEL 33-44-00.
45-01 Red Beacon Light Covers (Upper and Lower)	2	0	One or both may be missing with negligible penalty provided affected light is deactivated and considered inoperative. Refer to MMEL 33-45-00.
46-01 Logotype Light Covers	2	0	One or both may be missing with no penalty. Cover the cavity with speed tape.
47-01 Aft Strobe Light Lens (Airplanes with LED lights type)	2	0	One or both may be missing with negligible penalty provided affected lights are deactivated and considered inoperative. Refer to MMEL 33-47-00.

CONFIGURATION DEVIATION LIST			
System & Sequence ITEM Number **1.**	**2. Number installed**	**3. Number required for dispatch**	**4. Remarks and/or exceptions**
34 NAVIGATION			
32-01 Marker Beacon Antenna	1	0	May be missing with no penalty provided: a) Both Marker Beacon systems are considered inoperative, and b) Cavity is covered with blanking plate. Refer to MMEL 34-32-00.
51-02 DME Antenna	2	0	One or both may be missing with no penalty provided: a) Affected DME system is deactivated and considered inoperative, and b) Cavity is covered with blanking plate. Refer to MMEL 34-51-00.

INTENTIONALLY BLANK

CONFIGURATION DEVIATION LIST

System & Sequence ITEM Number 1.	2. Number installed	3. Number required for dispatch	4. Remarks and/or exceptions
38 WATER AND WASTE			
31-01 Forward / Aft Drain Masts	2	1	One may be missing with no penalty provided: a) Associated Drain Mast Heater is deactivated, b) Cavity is covered with blanking plate, c) Water supply to the associated galley and lavatory is secured off, and d) Procedures are established and used to ensure that the associated galley and lavatory sink is not used. Refer to MMEL 30-71-02.

INTENTIONALLY BLANK

CONFIGURATION DEVIATION LIST			
System & Sequence Number / ITEM / 1.	2. Number installed	3. Number required for dispatch	4. Remarks and/or exceptions
52 DOORS			
10-01 Door Deflectors (Passenger and Service)	4	2	One door deflector from each fuselage side may be missing with negligible penalty provided takeoffs are not conducted after ground exposures to freezing rain or freezing drizzle.
47-01 RAT Plug	1	0	May be missing with no penalty. Cover the cavity with speed tape.
82-01 Nose Landing Gear Door Seals	14	0	Any number or combination may be missing or partially missing provided for CAFM performance calculation a Drag Index of 45 is applied.

INTENTIONALLY BLANK

CONFIGURATION DEVIATION LIST

System & Sequence Number / 1. ITEM	2. Number installed	3. Number required for dispatch	4. Remarks and/or exceptions
53 FUSELAGE			
03-01 Forward Ramp Handset, Steering Disconnect Switch and External Power Supply 115 VAC Access Door (125AL)	1	0	May be missing with no penalty provided: a) Steering disengage switch is checked to be in the ENGAGE position and safety guard is checked to be actuated, b) Alternate procedures to towing airplane, ramp communication and external power connection are established and used, and c) Cavity is covered with speed tape. Refer to MMEL 23-52-00.
03-02 Waste Service Access Door (152AR)	1	0	May be missing with no penalty. Cover the cavity with speed tape.
03-03 Water Service Access Door (151AL)	1	0	May be missing with no penalty. Cover the cavity with speed tape.
03-04 External Power Supply 28 VDC, Aft Ramp Handset Access Door (313AL)	1	0	May be missing with no penalty. Cover the cavity with speed tape.
03-05 Hydraulic System 3 Ground Connector, Hydraulic Pressure Gauge Access Door (314AR)	1	0	May be missing with no penalty. Cover the cavity with speed tape.

CONFIGURATION DEVIATION LIST

System & Sequence Number	1. ITEM	2. Number installed	3. Number required for dispatch	4. Remarks and/or exceptions
53 FUSELAGE				
03-06	Jacking Point Adapter Access Panel (313BL)	1	0	May be missing with no penalty. Cover the cavity with speed tape.
03-07	Tailcone Attachment Access Panels (351EL/FR/CL/DR)	4	3	One may be missing with no penalty. Cover the cavity with speed tape.
03-08	Oxygen Pressure Gauge Access Door (132AR)	1	0	May be missing with no penalty. Cover the cavity with speed tape.
04-01	Internal and External Brushes (Fixed on the Landing Gear and on the Stub)	6	0	Any number or combination may be missing or partially missing with no penalty.
04-02	Wing To Fuselage Fairing Brushes (Fixed on the fuselage) (Applicable to Post-Mod. SB 170-00-0042 or with equivalent modification factory incorporated)	4	0	Any number or combination may be missing or partially missing with no penalty. **NOTE:** Item 53-04-02 may be missing simultaneously with any item from ATA 53 without additional penalty.
04-06	Hydraulic System Ground Service Access Doors (195 BR / 195 CL)	2	1	One may be missing with no penalty. Cover the cavity with speed tape.

CONFIGURATION DEVIATION LIST

System & Sequence Number / ITEM (1.)	2. Number installed	3. Number required for dispatch	4. Remarks and/or exceptions
53 FUSELAGE			
05-01 Drain Mast Rear Fuselage	1	0	May be missing with no penalty provided: a) Drain Mast fairing and next adjacent fairing is removed, b) Drain Tube inside Drain Mast fairing is removed, c) Remaining fairing and remaining draining tube is covered with speed tape, d) A visual check is made on the rear fuselage area to confirm it is free of fuel, oil or other liquid once each flight day, e) Airplane ground operations in precipitation condition is not allowed, and f) APU is not operated in flight.
05-02 APU Compartment Drain (Gravity Drain)	1	0	May be missing with negligible penalty provided APU is not operated in flight.
31-01 APU Oil Cooler Inlet	1	0	May be missing with negligible penalty provided APU is not operated in flight.

INTENTIONALLY BLANK

CONFIGURATION DEVIATION LIST			
System & Sequence ITEM Number 1.	2. Number installed	3. Number required for dispatch	4. Remarks and/or exceptions
55 STABILIZERS			
03-01 Vertical Tail Access Doors (323BL)	1	0	May be missing with no penalty. Cover the cavity with speed tape.
03-02 Vertical Tail Access Doors (323HR/JR)	2	0	One or both may be missing with no penalty. Cover the cavity with speed tape.
03-04 Vertical Tail Access Doors (323MR/NR)	2	0	One or both may be missing with no penalty. Cover the cavity with speed tape. **NOTE:** -Items 55-03-01, 55-03-02, 55-03-04: One access door panel is allowed to be missing with no speed tape and with negligible penalty until the next available maintenance base. -Avoid deicing and anti-icing fluid application directly to the cavity when speed tape is not applied.

CONFIGURATION DEVIATION LIST

System & Sequence ITEM Number 1.	2. Number installed	3. Number required for dispatch	4. Remarks and/or exceptions
55 STABILIZERS			
03-05 Vertical Stabilizer Access Panel Seal (RH)	4	-	May be missing with negligible penalty in one of the following conditions: - Up to two seals may be partially or totally missing in any combination, or; - Up to 25% length of all right-hand vertical stabilizer seal (aerodynamic + access panel) may be missing.
03-06 Horizontal Stabilizer Access Panel Seal (Lower Side)	12	10	One or two seals may be partially or totally missing in any combination with negligible penalty.
03-07 Vertical Tail Access Doors (323KR/LR)	2	0	One or both may be missing with no penalty. Cover the cavity with speed tape.
14-01 Horizontal Stabilizer Aerodynamic Seal (Upper Side)	8	7	One seal may be partially or totally missing with negligible penalty.
14-02 Horizontal Stabilizer Aerodynamic Seal (Lower Side)	12	10	One or two seals may be partially or totally missing in any combination with negligible penalty.

CONFIGURATION DEVIATION LIST

System & Sequence ITEM Number 1.	2. Number installed	3. Number required for dispatch	4. Remarks and/or exceptions
55 STABILIZERS			
24-01 Elevator Root Fairing Seal	2	0	One or two seals may be partially or totally missing with no penalty.
34-01 Vertical Stabilizer Aerodynamic Seal (LH) (Airplanes with 6 seals)	6	-	May be missing with negligible penalty in one of the following conditions: - One or two seals (2L, 3L, 4L or 5L) may be partially or totally missing in any combination, or; - One seal 1L or one seal 6L may be partially or totally missing, or; - Up to 25% length of all vertical stabilizer aerodynamic seal (LH) may be missing.
34-02 Vertical Stabilizer Aerodynamic Seal (RH)	5	-	May be missing with negligible penalty in one of the following conditions: - One or two seals (1R, 2R or 5R) may be partially or totally missing in any combination, or; - One seal 3R or one seal 4R may be partially or totally missing, or; - Up to 25% length of all right-hand vertical stabilizer seal (aerodynamic + access panel) may be missing.

CONFIGURATION DEVIATION LIST

1. System & Sequence ITEM Number	2. Number installed	3. Number required for dispatch	4. Remarks and/or exceptions
55 STABILIZERS			
34-03 Vertical Stabilizer Aerodynamic Seal (LH) (Airplanes with 4 seals)	4	-	May be missing with negligible penalty in one of the following conditions: - One seal may be partially or totally missing, or; - Up to 25% length of all vertical stabilizer aerodynamic seal (LH) may be missing.

CONFIGURATION DEVIATION LIST			
System & Sequence Number / 1. ITEM	2. Number installed	3. Number required for dispatch	4. Remarks and/or exceptions
57 WINGS			
00-01 Wing Jacking Point Adapter Access Panel	2	0	One or both may be missing or partially missing with no penalty. Cover the cavity with speed tape.
01-01 Noise Reduction panels	7	0	Any number or combination may be missing with no penalty. Cover the cavity with speed tape.
20-01 Vortex Generators	28	0	Any number or combination may be missing with negligible penalty.
30-01 Fence Wing Tip Fairings	2	0	One or both may be missing for day operations with no penalty.
49-01 Slat Track Slots Moveable Seals			
1) Symmetrical Sets	8	0	Any number or combination of symmetrical sets may be missing with negligible penalty.
2) Asymmetrical Sets	8	6	Up to 2 seals on any position may be missing asymmetrically with negligible penalty.
50-01 Wing Flap Trailing Edge Seals	2	0	One or both may be missing or partially missing provided for CAFM performance calculation a Drag Index of 45 is applied.
50-02 Wing Trailing Edge Seals (Spar 2)	2	0	One or both may be missing or partially missing with no penalty.

CONFIGURATION DEVIATION LIST			
System & Sequence Number / 1. ITEM	**2. Number installed**	**3. Number required for dispatch**	**4. Remarks and/or exceptions**
57 WINGS			
50-03 Wing Trailing Edge Seals (Spar 3)	2	0	One or both may be missing or partially missing with no penalty.
52-01 Flap Track Fairing Seals (All Inboard and Outboard Canoe Flap Seals)	62	0	Any number or combination may be missing or partially missing provided for CAFM performance calculation a Drag Index of 45 is applied. **NOTE:** Wing-to-fuselage flap track fairing seals must be installed.

CONFIGURATION DEVIATION LIST			
System & Sequence Number / ITEM / 1.	2. Number installed	3. Number required for dispatch	4. Remarks and/or exceptions
71 POWERPLANT			
11-01 Inboard Nacelle Strakes	2	1	One may be missing provided the following performance penalties are applied. <u>Takeoff</u> - Flaps retraction speed for flaps 1 to 0 must be increased in 10 kt. - There are no obstacles in the net Takeoff Flight Path above Level Off Height. <u>Landing</u> - V_{REF} is increased by 7 kt (flaps FULL/ice condition) or by 3 kt (all other conditions). - A V_{REF} Overspeed increment of 7 kt (flaps FULL/ice condition) or 3 kt (all other conditions) must be considered for CAFM performance calculation. - Landing climb weights are reduced by 1472 lb (668 kg) for flaps 5 or by 586 lb (266 kg) for flaps FULL/no ice condition or by 4475 lb (2030 kg) for flaps FULL/ice condition. **NOTE: -** Items 57-20-01, 57-49-01 and 57-50-01 should not be missing simultaneously with inboard nacelle strake. (Continued)

CONFIGURATION DEVIATION LIST			
System & Sequence Number — ITEM — 1.	**2. Number installed**	**3. Number required for dispatch**	**4. Remarks and/or exceptions**
71 POWERPLANT			
11-01 Inboard Nacelle Strakes (Continued)			(Continued) **NOTE: -** If outboard strake is missing, it may be replaced by the inboard strake from the other side nacelle.
13-01 Engine Aft Core Cowl Aerodynamic Seal (Applicable to engines equipped with Aft Core Cowl P/N 15F0020-021 or 15F0021-017)	4	0	Any number or combination may be missing with no penalty. **NOTE:** Item 71-13-01 may be missing simultaneously with item 71-11-01 without additional penalty.

CONFIGURATION DEVIATION LIST			
System & Sequence Number — ITEM — 1.	**2. Number installed**	**3. Number required for dispatch**	**4. Remarks and/or exceptions**
78 EXHAUST			
30-01 Thrust Reverser Inhibit Pin Cover Plate	8	0	Any number or combination may be missing with negligible penalty.

INTENTIONALLY BLANK

APPENDIX 2

GUIDANCE INFORMATION

TABLE OF CONTENTS

INTRODUCTION

This appendix presents information relevant to EMBRAER 170 operation which is not required by Airworthiness Regulation.

This appendix is not approved by the Authority and must be used as a guidance information.

Whenever necessary, the information contained herein shall be previously approved by the local authority.

NOISE LEVELS - ICAO ANNEX 16 CHAPTER 4

Effective Perceived Noise Level (EPNL) exceedances for EMBRAER 170 models and engine versions are listed in the tables below. All the data herein presented is based on the EMBRAER 170 airplane noise certification test data base.

Compliance to ICAO Annex 16 Section 4.4 is met when:

1. Of the 3 noise levels, none may exceed the Stage 3/Chapter 3 limits, without considering trades. Thus the maximum Stage3/Chapter 3 exceedance at any one point is 0 dB.
2. For any two of the 3 conditions, the sum of the exceedances at any 2 conditions must be less than -2 dB.
3. The sum of the exceedances at all 3 conditions must be less than -10 dB.

The correspondent engine noise level, as perceived by human ear, is presented at the Maximum A-Weighted Sound Level table.

MODELS: LR AND SU ENGINE: CF34-8E5

EFFECTIVE PERCEIVED NOISE LEVELS

Condition	Gross Weight	Flap	Test EPNL (dB)	Stage 3/ Chapter 3 Limit (dB)	Exceedance (dB)
Flyover	MTOW	1	84.08	89.00	-4.92
Lateral	MTOW	1	92.26	94.23	-1.97
Approach	MLW	6	94.89	98.21	-3.32
				Cumulative	-10.21

MAXIMUM A-WEIGHTED SOUND LEVELS

Condition	Gross Weight	Flap	Noise – dB (A)
Flyover	MTOW	1	71.7
Approach	MLW	5	84.6
Approach	MLW	6	85.5

INTENTIONALLY BLANK